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ABSTRACT

This study of the status of public education in the United States attempts to determine the implications for Union Carbide and recommends a role for the corporation in addressing national education issues. The report focuses on how well the education system is meeting the economic interests of our country and the company. The following chapters are included: (1) "Evaluating the Status of Education"; (2) "Implications of Findings"; (3) "What Needs to be Done"; (4) "Obstacles to Change"; and (5) "Proposed Union Carbide Response." The task force's research indicates that there is a critical problem with the American educational system and it is much misunderstood, and that there is a need for drastic systematic reforms. Union Carbide's proposed role in reforming education includes the following components: (1) a powerful information campaign to change public attitudes toward education; (2) a leadership role in creating a national coalition to establish educational goals; (3) demonstration programs of school reform in two Carbide communities; and (4) an internal information program to raise employee awareness of the education issue and to encourage parents to become more active in their children's schools. A list of 41 notes is included, along with a description of the research process. Synopses of 14 speeches from the Union Carbide Corporation Forum on Emerging Education Issues are presented. (JS)

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Report to R.D. Kennedy
Chairman and Chief Executive Officer
Union Carbide Corporation

from the
Corporate Task Force on Education

UD 027 283

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PREFACE

Robert D. Kennedy, Chief Executive Officer and Chairman of the Board of Union Carbide Corporation, established a corporate task force on education in December of 1988 to study elementary and secondary education and to report to him on an appropriate role for Union Carbide in addressing that issue. The report that follows is the result of six months of research and discussion with educators, thought leaders and other business representatives. Although the Task Force recognized that learning is valued in its own right, the focus of the report is on how well the education system is meeting the economic interests of our country and the company.

The Task Force is aware that there are numerous pockets of educational excellence in this country and many, many talented educators. The problem of educational performance of our students, however, is a collective one when viewed from a national perspective. We thus acknowledge the effort and ability of the classroom teachers and administrators who are capably serving their students, while we focus on shortcomings of a system which restrains the achievement of educational excellence.

The report concludes with a set of recommendations for Union Carbide involvement, as a corporate citizen, in the broadening effort to establish a world class education system by the dawn of the next century. The recommendations contained herein are intended to guide the direction of Union Carbide activity over a long term. The extent to which each project will be implemented and the exact form each will take is uncertain at this writing. Programs, like their creators, must grow and adapt to changing external influences, new insights and unanticipated opportunities.

—Nancy W. Deibler, Chair
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EXECUTIVE SUMMARY

Report to The Chairman, Union Carbide Corporate Task Force on Education

OUR VISION Every child who reaches the age of seventeen can read sophisticated materials, write clearly, speak articulately and solve complex problems requiring algebra and statistics. Unconstrained by a shortage of competent, well-educated workers, American industry is able to expand and develop as rapidly as world markets allow. Boosted by the productivity of a well-qualified workforce, U.S.-based companies reassert historic American leadership in old and new industries, and American workers enjoy the rising standards of living they enjoyed in the 1950s and 1960s.

Adapted from Workforce 2000, *the Hudson Institute Study on Work and Workers of the 21st Century*

The Union Carbide Corporate Task Force on Education concludes that we will not fulfill this vision without fundamental changes in our elementary and secondary education systems.

The Union Carbide Corporate Task Force on Education was established to study public education in the United States, to determine the implications for Union Carbide and to recommend a role for the Corporation in addressing national education issues. After six months of research, the Task Force determined that there is a critical problem and it is much misunderstood.

The problem is that schools have remained the same while the economy and society have changed and the country's educational needs have become greater. The result is a relative decline in school performance.

Our school system was designed for an agricultural economy and the structure has not changed for over 100 years. Back then, it was not necessary, or even desirable, to highly educate

everyone. We must reach for this goal today. But we have an outmoded system incapable of meeting modern needs.

Four converging trends alert us that trouble is ahead. Our population growth rate is declining and we have a shrinking number of 16 to 22-year-olds entering the workforce. Jobs require higher levels of knowledge and skills. Student achievement has not increased significantly and by some indicators has sharply declined over the past 20 years. And minority students, who are least well served by the school system, are the fastest growing segments of the population.

We must educate a larger portion of students more highly if we are to meet our country's labor needs. This means increasing student achievement levels across-the-board. Inherent limitations in our school system prevent it from living up to this challenge.

Without improvements, we have, at best, an undereducated population which keeps this nation from realizing its highest economic potential. More likely, we have a threat to our international competitiveness and to our standard of living.

International comparisons of science and math achievement, which rank our students near the bottom, lead us to realize how much better we could be doing. The fact that other nations are developing more of their human potential is reflected in those countries' gains in the world marketplace.

The high school dropout rate for the nation is 25 percent. For the key Carbide states of Texas, Louisiana and West Virginia, it is 35 percent, 40 percent and 24 percent, respectively. It is estimated that 50 percent of the U.S. population will be functionally illiterate by the turn of the century. Yet, there will be fewer jobs for those who cannot read, follow directions and use mathematics.

There are signs that the country is already facing a shortage of qualified workers. A 1989 poll of the FORTUNE 500 companies indicated that over half of the 400 respondents currently find it difficult to hire employees with good basic skills. One third of the companies offer their employees remedial courses to improve reading, writing and math abilities. Productivity losses caused by poorly trained workers and remedial training cost industry about $25 billion a year...a cost our closest international competitors do not have.

Some of the fastest growing fields, such as engineering and science, are those with simultaneously shrinking pipelines of interested and prepared students. These are the same occupations that are most valuable to Union Carbide and most directly affect our competitiveness.

We are already experiencing the expense of a tighter labor market in the engineering and science fields. Not only do we have to search harder for qualified candidates, but we have the cost of higher starting salaries. In the past, these swings in supply have corrected themselves. A look at the demographics and the math and science test scores of students in the pipeline, however, leads to the conclusion that a tight labor market may be an increasing long-term problem and expense.

In addition to professional workers, there is need to be concerned about the supply of qualified hourly workers and support staff. The education problem, as Albert Shanker, President of the American Federation of Teachers, points out, is widespread. It is not just a minority problem. "If you pressed a button and every group of minority students functioned at the same level as whites, we would still have a national disaster in education."

On a National Assessment of Educational Progress study, only 4.9 percent of all graduating 17-year-olds could use a bus timetable; 12 percent could solve problems using common fractions; 5 percent could write a detailed persuasive letter.

A labor pool of increasingly unqualified workers is a serious constraint to national productivity and economic growth. If the U.S. economy suffers, so does Union Carbide. Seventy percent of our business is domestic. We have a $6.7 billion capital investment here. Even if we were not based in the U.S., we would be concerned about the economic health of this market.

If workers are unemployable due to their lack of knowledge, they are a cost to society and to Union Carbide as a taxpayer. We pay for the cycle of ignorance, poverty and crime.

The alternative is to better educate a larger percentage of students so there will be jobs for them. People who would have otherwise become dependent on this nation's productivity could then contribute to it.

A number of education thought leaders agree on what should be done to make schools more productive. They told us, "Don't tinker, go for major systemic reforms."

They recommend overhauling school organizations by giving schools more autonomy, empowering teachers, parents and principals, modernizing instruction and raising expectations of all students. They say strengthen the teaching profession by rewarding performance and responsibility and by reforming teacher preparation. Hold teachers and schools accountable for results, not for how well they follow guidelines. The general thrust is to bring decision making down, closer to the "student-product" and to establish clear goals and measures of performance—reflections of modern business management.

We learned that better education is not primarily a question of money. Pouring more funds into the same system will just keep it running in place.

Since there seems to be general agreement about what needs to be done, one asks why so little change has taken place. Actually, this is not surprising considering there are 16,000 independent school bureaucracies in the nation with about a century of experience invested in the status quo. The system is resistant to change and the momentum cannot come from the inside.

An entrenched bureaucracy is one major obstacle to reform. Other barriers are a low public awareness and understanding of the inadequacies of the education system and lack of parental involvement, which breeds inattention to the need for change. Fewer people have children so there is less direct interest in what is going on educationally. We seem to be losing sight of the "spill-over" benefits of education to society as a whole.

Still more factors restrict the momentum for action. Lack of clear goals for schools make it difficult to judge outcomes and seeds of change are smothered by the cumbersome system of school regulation. Finally, public education is a monopoly and customers appear each year—regardless of how well they are being served.

Catalysts for change must come from outside the system. Educators with vision are asking for help from without.

And this is an appropriate and critical role for business to play. Over $180 billion is spent annually on education. Business has a major investment in the system, through tax dollars, and a major stake in its output. We have an obligation to make sure the system performs optimally. We need to join forces with other businesses and organizations in making change happen.

SPECIFICALLY, THE TASK FORCE RECOMMENDS THAT UCC:

Support and initiate programs designed to bring down the barriers to school reform and to stimulate change. These efforts should be directed both externally, to the general public and internally, to our employees.

THE CORNERSTONES SHOULD BE:

1. A POWERFUL INFORMATION CAMPAIGN TO CHANGE PUBLIC ATTITUDES TOWARD EDUCATION.

UCC would take a leadership role in coordinating a massive effort to raise public expectations similar in scope to the national AIDS and smoking awareness efforts.

UCC could work through The Business Roundtable, The Advertising Council and/or through a new coalition of business and other organizations. The objective of the campaign would be to create a climate for change by building a public vision of what can be. Impact of the campaign would be assessed.

R.D. Kennedy would include the education message in speeches and public appearances.

The campaign could include replication of the UCC "Emerging Education Issues Forum" in key Carbide communities as a means of sensitizing employees and local thought leaders to ideas for reform and the need for change.

2. LEADERSHIP ROLE IN CREATING A NATIONAL COALITION TO ESTABLISH EDUCATIONAL GOALS.*

Education today is like an industry unclear about its product and, therefore, unable to practice quality control. There is no

** Since the writing of this report, the National Governors Association has taken the lead to establish national goals. Union Carbide activities in pursuit of educational goals will be coordinated with the National Governors Association effort.*

definition of an educated person and thus no way to evaluate school performance. Without clear goals by which progress can be determined, school reform efforts remain fragmented and momentum diffused.

There is a need for national goals by which state school performance can be measured. Currently there are no funds dedicated to this purpose and, more importantly, it's nobody's job.

A major barrier to education reform would be removed if a non-governmental coalition of business, educators and political leaders developed the yardsticks for measuring how well states are doing. The group might be known as the National Coalition for Educational Excellence.

This effort should not be confused with creating a national curriculum. What to teach and how to teach it would be state and local options. The national framework would be defined in functional terms—what the student should be able to do.

3. BOLD DEMONSTRATION PROGRAMS OF SCHOOL REFORM IN TWO CARBIDE COMMUNITIES. UCC WOULD SPONSOR MODELS FOR MAJOR SCHOOL RESTRUCTURING. RESULTS WOULD BE SHARED WITH THE NATION.

Models would be built around principles of teacher autonomy, parental involvement, school-based management, raised expectations for academic performance, clear goals and measures of accountability, and greater "results orientation" rather than "process orientation." There would be a "mentor" component in which active or retired Carbide volunteers would pair up with "at risk" students and provide support and encouragement.

Expectations should be for broad and significant increases in student achievement, higher school retention, percentage increases in college-bound students, higher skill-level placement of vocational students, raised teacher morale and professionalism, and greater parental support.

To determine with which communities to work, UCC could put our proposal "out-to-bid" in locations in which we have a major presence and stake in the output of the schools. The systems which make us the best offer of community cooperation,

willingness to experiment and desire for partnership would be selected. This method is designed to overcome the political obstacles to change.

4. A RIGOROUS AND HIGH-PROFILE INTERNAL INFORMATION PROGRAM DIRECTED TO RAISE EMPLOYEE AWARENESS OF THE EDUCATION ISSUE AND TO ENCOURAGE PARENTS TO BECOME MORE ACTIVE IN THEIR CHILDREN'S SCHOOLS.

Employees are involved in their communities and help make local policy. They are a captive audience for information and their understanding of the education issue makes a difference. Incentive programs should be devised to increase employee representation on local school boards. Full and in-depth preparation for school board involvement should be offered.

COMPLEMENTARY ACTIONS:

While these four undertakings would constitute the main thrust of the UCC effort, the Task Force identified additional programs which would complement and round out the involvement. They are:

1. INCENTIVE PROGRAMS FOR TEACHERS IN CARBIDE COMMUNITIES TO BECOME "BOARD CERTIFIED."

This new voluntary opportunity will be run by the National Board for Professional Teaching Standards and will be offered for the first time in 1993. This board certification program is meant to parallel the credentials offered in other professions like medicine and law. Teachers will undergo classroom observations and sophisticated new tests of their expertise.

2. POLITICAL SUPPORT OF LEGISLATIVE CHANGES IN KEY CARBIDE STATES AND AT THE NATIONAL LEVEL WHICH FAVOR SCHOOL REFORM, SUCH AS DEREGULATION OF EDUCATION, ALTERNATIVE ROUTES TO TEACHER CERTIFICATION AND FULL FUNDING OF HEAD START PROGRAMS.

In order to bring about drastic change in education, the regulations obstructing movement have to be repealed. New roles have

to be defined for states so they become monitors of outcomes, not procedures. Opportunities for experimentation and revitalization may have to be authorized by law.

3. AN INTERNAL PROGRAM WHICH WOULD FACILITATE A MID-CAREER SWITCH TO TEACHING FOR INTERESTED CARBIDERS AND/OR WOULD ALLOW FOR TEACHING ASSIGNMENTS WITH SIMULTANEOUS CARBIDE RESPONSIBILITIES.

Carbide employees tend to have backgrounds in subject areas with teacher shortages. States are beginning to allow "alternate routes to certification" for people with subject matter expertise but no teacher training. Matching employee skills with community needs would not only nourish educational resources, but would help strengthen the relationship between schools and industry.

4. FINANCIAL SUPPORT AND PROMOTION OF PROGRAMS TO ENHANCE MATH AND SCIENCE TEACHING SKILLS AT THE ELEMENTARY LEVEL IN KEY CARBIDE COMMUNITIES.

The strength of the math and science skills developed at the elementary and secondary levels greatly influences the number of young people who continue in these fields. Efforts to enhance the skills of elementary teachers in these subject areas should go simultaneously with the restructuring effort.

5. FINANCIAL SUPPORT OF PROGRAMS TO ADDRESS POTENTIAL TEACHER SHORTAGES AND TO REFORM TEACHER PREPARATION PROGRAMS.

Over the next 10-15 years we will replace virtually all the 2.3 million teachers in our schools. This turnover not only provides an opportunity to energize the teaching profession, but also indicates a need to attract a lot of new individuals to teaching.

NEW INITIATIVES MUST BE IN ADDITION TO CURRENT UCC PROGRAMS:

The Task Force recognizes the extended time horizon required to demonstrate results. During the interim, we must continue to aggressively support complementary programs that are

more short-term and UCC-return focused. Programs such as INROADS, summer internships, co-ops, college relations liaisons, university/college financial contributions, upward mobility efforts and continuing employee education and development must be supported to assure ourselves that we are gaining a maximum return on our "people capital."

The Task Force acknowledges that as UCC takes on a more leading and public role in the educational reform movement, we must be able to credibly withstand a review of those human resource systems that we alone control. We believe that we will become more comfortable in our new advocacy role as positive strides within UCC continue to be made in these areas.

IMPLEMENTATION MECHANISMS:

The Task Force believes that the issue of public education deserves bold, meaningful action on the part of Union Carbide or none at all. To dabble in the problem will not significantly improve school performance and will not be an efficient use of UCC resources.

To make an impact, UCC's commitment to the recommended projects must be long term—not less than 10 years. We believe strongly that the implementation mechanism must provide continuity and stability to the program both in terms of the staff time and financial resources.

There is no limit to the amount of money that could be devoted to the course of action outlined above. Projected costs can be determined once a general course of action is endorsed. A second phase of the Task Force's work will be to flesh out tactical issues and estimate budget and human resource requirements.

The Task Force suggests that the program be funded through the corporate contributions budget. This would be consistent with the proposed 1990-95 Philanthropic Investment Plan.

Introduction

The Union Carbide Corporate Task Force on Education was established to study the status of public education in the United States, to determine the implications for Union Carbide and to recommend a role for the corporation in addressing national education issues. We spent six months gathering information, reviewing findings and identifying areas of concern. Finally, we developed a list of options for a Union Carbide response to the issue and outlined a recommended company role.

PROCESS USED BY THE TASK FORCE:

A major portion of the Task Force's activity involved gathering information. We met with leading educators, researchers and thought leaders, as well as a group of school superintendents from our headquarters area. In addition, we held a day-and-a-half Forum on Emerging Education Issues which featured presentations by 14 nationally recognized thinkers on education and the relationship of education to international competitiveness. Representatives of the Task Force attended additional conferences on education sponsored by other organizations and businesses. Finally, we reviewed publications and documentaries on U.S. education, including the recent "Learning in America" series. The report section "Research Process" describes the Task Force's efforts in detail.

CHAPTER 1

Evaluating the Status of Education

To evaluate the status of education it is necessary to review the system's functions. How well is the system doing what it is supposed to? Although learning contributes to society in many ways and is valued for its own sake, we were interested in education's role in nourishing the economic health of our nation. For the purposes of this study, the Task Force looked at the relationship between the product of the school system and the country's and this company's emerging labor needs.

We examined the changing nature of our economy and the educational and skill demands of future jobs. We also looked at the demographics of the future labor supply and the implications for the future labor pool. Finally, we studied indicators of our school system's success in educating future workers.

OUR FINDINGS:

There is a growing mismatch between the educational and skill qualifications of individuals entering the workforce and the labor demands of the economy. This is the result of several simultaneously converging trends in demographics, the changing nature of the economy and the educational levels of the emerging workforce.

THE ECONOMY AND FUTURE JOBS:

The economy is shifting to a high-technology manufacturing base and strong service economy. The fastest growing jobs demand higher skills and education levels. There will be fewer jobs for those who cannot read, follow directions and use mathematics.

Economic development is evolutionary. As an advanced industrial nation, we have seen agriculture yield to manufacturing as the dominant economic activity. Now manufacturing is a shrinking share of the economy and the service industries—those industries that create economic value without creating a tangible product—dominate and will create most of the new wealth over the next decade. It is the service industries which will produce all of the new jobs.[1] Jobs in manufacturing are expected to decrease.[2] In a Labor Department survey released in June, manufacturing jobs fell by 18,000 in May, while jobs in the service sector gained by 65,000.[3]

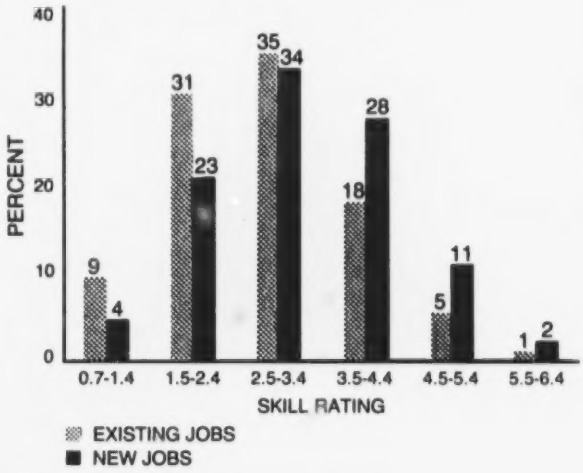
Although "service industry" is often associated with low-paying, low-skilled jobs, four of the five top service employers pay well and deal with advanced technology—i.e., education, health care, general government and finance/insurance/real estate.[4] The labor demands of the service industries will determine the characteristics of the new jobs in the next 10 years.

Figure 1 shows the incidence of existing and projected jobs by skill rating. We see that the occupations expected to grow fastest require much higher math, language and reasoning capabilities. Jobs that we currently think of as requiring medium skills will be the least skilled jobs of the future.[5]

Another way to look at tomorrow's jobs is from the perspective of education required. It is projected that more than half will require some education beyond high school as compared to 42 percent of the jobs

Figure 1

LOW-SKILLED JOBS ARE DECLINING



SKILL RATINGS OF TYPICAL JOBS

Natural Scientists	5.7
Lawyers	5.2
Engineers	5.1
Management	4.4
Teachers	4.2
Technicians	4.1
Marketing and Sales	3.4
Construction	3.2
Administrative	2.9
Service Occupations	2.6
Precision Production	2.5
Farmers	2.3
Transport Workers	2.2
Machine Setters	1.8
Hand Workers	1.7
Helpers and Laborers	1.3

SOURCE: Hudson Institute

today. Almost one-third will require college graduates, while only 22 percent of jobs require a college degree today. The following is a chart (Table 1) of the projected growth rates in various occupations between 1984 and 2000. Note that the fastest growing fields are lawyers, scientists and health professionals. Other occupations in which above-average increases are expected are in professional and technical, managerial, sales and service jobs. Jobs as machine tenders, assemblers, miners and farmers are expected to decline.[6]

The median years of education required by the new jobs created between 1984–2000 will be 13.5 compared to 12.8 for the current workforce. Only 14

Table 1
THE CHANGING OCCUPATIONAL STRUCTURE, 1984–2000

Occupation	Current Jobs (000s)	New Jobs (000s)	Rate of Growth (Percentage)
Total	105,008	25,952	25
Service Occupations	16,059	5,957	37
Managerial and Management Related	10,893	4,280	39
Marketing and Sales	10,656	4,150	39
Administrative Support	18,483	3,620	20
Technicians	3,146	1,389	44
Health Diagnosing and Treating Occupations	2,478	1,384	53
Teachers, Librarians, and Counselors	4,437	1,381	31
Mechanics, Installers, and Repairers	4,264	966	23
Transportation and Heavy Equipment Operators	4,604	752	16
Engineers, Architects, and Surveyors	1,447	600	41
Construction Trades	3,127	595	19
Natural, Computer, and Mathematical Scientists	647	442	68
Writers, Artists, Entertainers, and Athletes	1,092	425	39
Other Professionals and Paraprofessionals	825	355	43
Lawyers and Judges	457	326	71
Social, Recreational, and Religious Workers	759	235	31
Helpers and Laborers	4,168	205	5
Social Scientists	173	70	40
Precision Production Workers	2,790	61	2
Plant and System Workers	275	36	13
Blue Collar Supervisors	1,442	– 6	0
Miners	175	– 28	– 16
Hand Workers, Assemblers, and Fabricators	2,604	– 179	– 7
Machine Setters, Operators, and Tenders	5,527	– 448	– 8
Agriculture, Forestry, and Fisheries	4,480	– 538	– 12

SOURCE: Hudson Institute

percent of jobs will require less than a high school education while 18 percent of today's jobs can be filled by persons not completing 12 years of school. These estimates assume that the occupational requirements for the new jobs remain what they are for these jobs today. The trend is for new jobs to have upgraded educational standards.[7]

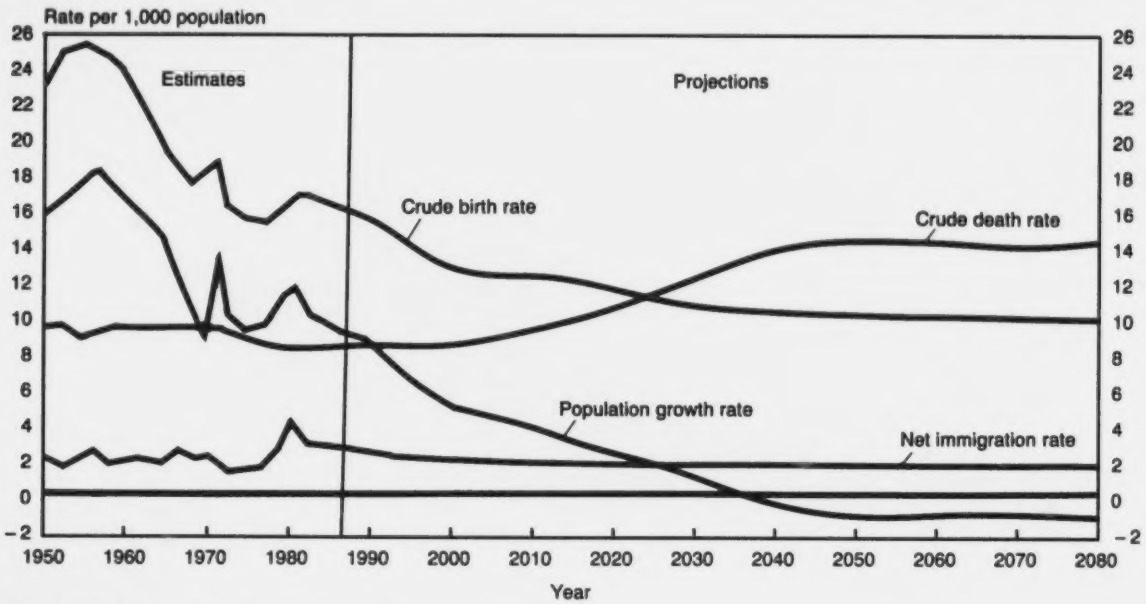
SHIFTING DEMOGRAPHICS:

Information regarding the level of education or skills needed by employers is only relevant when related to the availability of the corresponding labor supply. Several demographic projections suggest there will be an increasing shortage of qualified labor.

In the short term, the population and workforce is growing more slowly than at any time since the 1930s. The size of the emerging labor pool of 22-year-olds is declining. Therefore, in order to increase the number of better educated new workers, we have to better educate a growing proportion of students.

After 1995, the rate of population growth is predicted to be the slowest ever. This dynamic is expected to tighten the labor market and increase competition for the smaller reservoir of highly educated and qualified workers. The population growth trends are illustrated in Figure 2.[8] Table 2 shows estimates of actual numbers of 14 to 24-year-olds over a period of years.[9]

Figure 2
POPULATION GROWTH TRENDS



SOURCE: U.S. Bureau of the Census, *Current Population Reports*
NOTE: Crude refers to very rough measure.

Table 2

POPULATION, BY AGE: 1960 TO 2080

(Numbers in thousands. As of July 1. Includes Armed Forces overseas)

Year	Age (years) 14-17	18-24
Estimates		
1960	11,219	16,128
1965	14,153	20,293
1970	15,924	24,712
1975	17,128	28,005
1980	16,142	30,350
1985	14,865	28,749
1987	14,467	27,336
Projections		
Lowest series:		
1990	13,158	25,865
1995	14,353	23,858
2000	15,098	24,728
2005	14,582	26,255
2010	13,242	25,531
2020	11,721	21,525
2030	11,315	20,274
2040	10,090	18,952
2050	9,219	16,899
2080	7,193	13,244
Middle series:		
1990	13,237	26,140
1995	14,510	24,281
2000	15,332	25,231
2005	15,491	26,918
2010	14,746	27,155
2020	14,074	25,018
2030	14,574	25,290
2040	14,036	25,408
2050	13,771	24,411
2080	13,089	23,288
Highest series:		
1990	13,292	26,352
1995	14,651	24,704
2000	15,593	25,870
2005	16,551	27,809
2010	16,654	29,212
2020	17,376	29,811
2030	19,448	32,633
2040	20,409	35,474
2050	21,669	37,015
2080	25,647	43,892

SOURCE: U.S. Bureau of the Census, *Current Population Reports*

NOTE

The series indicated above are based on a set of projections that included 30 scenarios representing each possible combination of high, middle and low projections. The "middle" series represents the "most likely to happen."

Another area of shifting characteristics is the composition of the small net increase in the population and labor force. Blacks, Hispanics and other minorities will make up a large share of the expansion of the labor force. Non-whites will comprise 29 percent of the net labor force increase between 1985 and 2000.[10] Table 3 shows population trends by race.[11]

Table 3

POPULATION, BY RACE: 1960 TO 2080

Year	Percent of total population that is White	Black	Other races
Estimates			
1960	88.6	10.6	0.9
1965	88.1	10.8	1.0
1970	87.6	11.1	1.3
1975	86.9	11.5	1.7
1980	85.9	11.8	2.3
1985	84.9	12.1	3.0
1987	84.5	12.2	3.2
Projections:			
1990	84.1	12.4	3.5
1995	83.3	12.8	3.9
2000	82.6	13.1	4.3
2005	81.8	13.4	4.8
2010	81.0	13.7	5.2
2020	79.6	14.3	6.1
2030	78.2	14.8	6.9
2040	76.9	15.3	7.8
2050	75.6	15.7	8.7
2080	72.6	16.3	11.1

SOURCE: U.S. Bureau of the Census, *Current Population Reports*

These workers have already been born and are in the work-preparation pipeline. In key Carbide states like Texas and Louisiana, the percentage of black and Hispanic children in the public school system is currently nearly 50 percent.

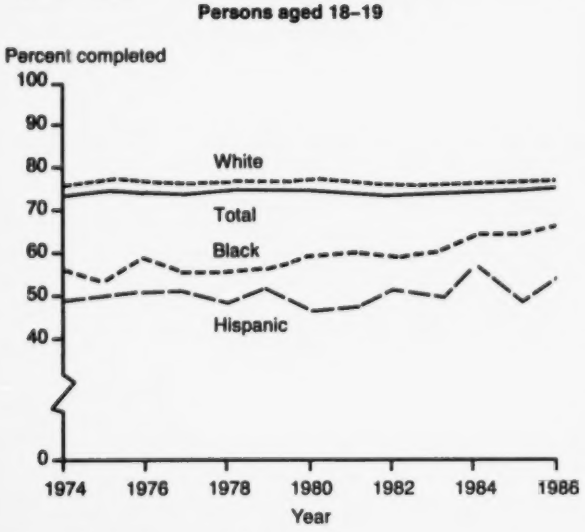
The relevance of these statistics to the capabilities of the labor supply is that many members of the groups which comprise growing percentages of the population have not been trained and educated for the types of jobs that are growing fastest.

INDICATORS OF SCHOOL PERFORMANCE AND PROGNOSIS FOR IMPROVEMENT:

It is hard to judge school performance. The most widely used indicators in America are high school retention rates and SAT scores. These measures have important shortcomings but are probably still the best available indicators of group-to-group differences and trends over time. International test score indicators tell us how our student performance compares to students in other countries. The closest indicator we have of how well schools are meeting society's needs is the experience of employers who are the customers for the school system's product.

Dropout rates and test scores tell us that student achievement has not significantly increased and has actually declined in some areas over the past 20 years. The same indicators also show a pattern of unequal achievement among racial and ethnic groups. These achievement levels signify a national crisis.

Figure 3
TRENDS IN HIGH SCHOOL COMPLETION RATES, BY RACE AND HISPANIC ORIGIN: 1974–1986



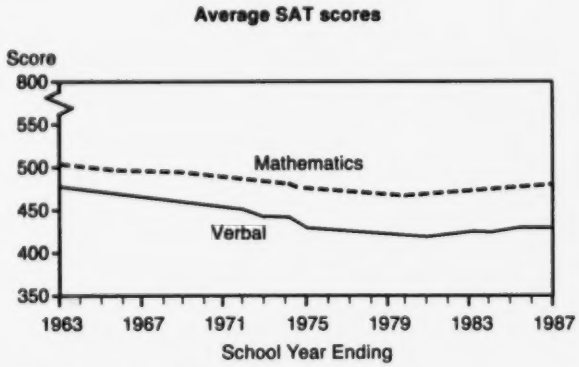
NOTE: Hispanics may be of any race.
SOURCE: U.S. Bureau of the Census, *Current Population Reports*

The problem is that modern society's educational needs are greater than they used to be. With job skill and education requirements increasing and the pool of new workers shrinking, there is growing pressure on schools to improve achievement among *all* students. In light of these new demands, the indicators tell us that schools are falling far short of the challenge.

The national average of high school retention rates has remained almost steady at 75 percent since 1974 (see Figure 3).[12] In key Carbide states of Texas, Louisiana and West Virginia, the rates are 65 percent, 60 percent and 76 percent, respectively. Today, this is not good enough. Note that the completion rates for black and Hispanic students are lower than those of white students.

High school dropouts are not the only concern. On a National Assessment of Educational Progress study, only 4.9 percent of the 17-year-old graduating students could use a bus timetable; only 12 percent could solve problems using common fractions; 5 percent could write a detailed persuasive letter. By this measure only 5 percent of graduates are prepared for college work at the level we used to require before higher education became more open.[13]

Figure 4
TRENDS IN COLLEGE ENTRANCE EXAMINATION SCORES



SOURCE: College Entrance Examination Board

Another indicator of student performance is the Scholastic Aptitude Test (SAT). SAT scores were dropping from 1963 to 1982. Since then they have increased slightly. They are still 74 points below the 1963 level (see Figure 4).[14] Significantly, the scores have dropped most sharply at the top. Only half as many students score over 650 as 20 years ago.[15]

Table 4
SCHOLASTIC APTITUDE TEST SCORE AVERAGES, BY RACE/ETHNICITY: 1975–76 to 1986–87

Racial/ethnic background	1976-77	1979-80	1982-83	1986-87
1	3	6	9	12
SAT-Verbal, all students	**429**	**424**	**425**	**430**
White	448	442	443	447
Black	330	330	339	351
Mexican-American	370	372	375	379
Puerto Rican	355	350	358	360
Asian-American	405	396	395	405
American Indian	390	390	388	393
Other	402	394	386	405
SAT-Mathematical, all students	**470**	**466**	**468**	**476**
White	489	482	484	489
Black	357	360	369	377
Mexican-American	408	413	417	424
Puerto Rican	397	394	403	400
Asian-American	514	509	514	521
American Indian	421	426	425	432
Other	457	449	446	455

NOTE

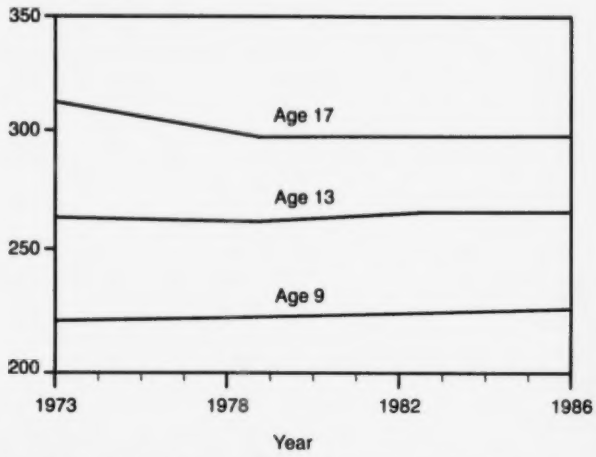
No race/ethnic group data are available prior to 1975–76. No data were available for 1985–86 due to changes in the Student Descriptive Questionnaire completed when students registered for the test.

SOURCE: Reprinted with permission from *College-Bound Seniors National Report: 1987 Profile of SAT and Achievement Test Takers*, copyright © 1987 by College Entrance Examination Board, New York.

Table 4 shows a breakdown of these scores by race. Again, scores of the white students are significantly higher than those of non-white students—with the exception of the Asian-American mathematics scores.[16]

Other student performance tests tell the same story. Figure 5 shows trends in mathematics proficiency scores for 17-, 13- and 9-year-olds between 1973 and 1986. According to the National Assessment of Educational Progress, "In spite of improvements in 9-year-old and 13-year-old average mathematics achievement, scores remain low."[17]

Figure 5
TRENDS IN AVERAGE MATHEMATICS PROFICIENCY: SELECTED YEARS, 1973-1986



SOURCE: National Assessment of Educational Progress, 1988

NOTES:
Mathematics Proficiency Scale:
150 = Simple arithmetic facts
200 = Beginning skills and understanding
250 = Basic operations and problem solving
300 = Moderately complex procedures and reasoning
350 = Multistep problem solving and algebra

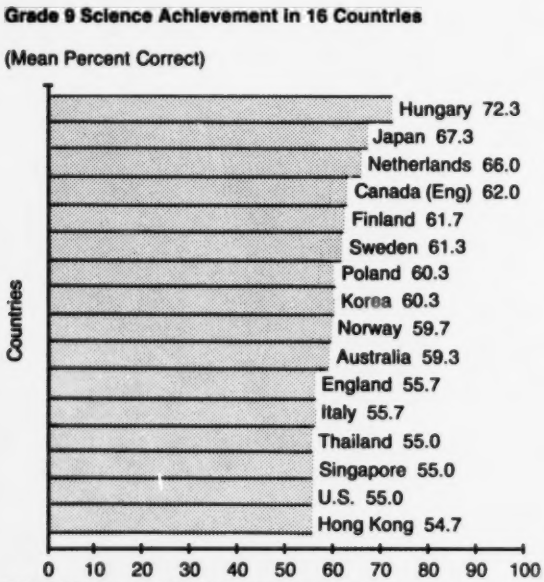
The 1973 mathematics assessment was not included in the scaling of NAEP trend data. However, a rough estimate of the 1973 mean level of student math proficiency was computed by NAEP.

International comparisons of academic achievement are meaningful as measures of how well we could be doing and help give us a perspective on student potential. On science achievement tests, U.S. students consistently rank lower than students of other countries. Ninth grade students ranked 15th among students from 16 countries. U.S. students completing a second year of biology scored the lowest of 13 countries (see Figures 6 and 7).[18]

Figure 6

Science Achievement in Grade 9

On an international science achievement test, U.S. Grade 9 students ranked 15th among the 16 countries whose data have been analyzed. In the United States, 2,519 students in 119 schools responded to the science achievement tests.



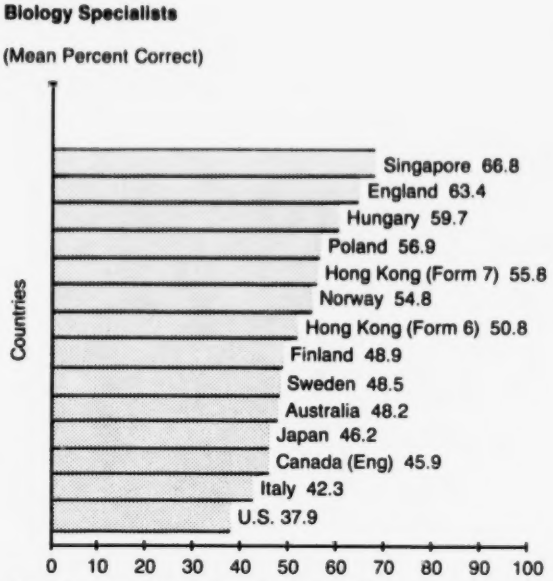
SOURCE: Second IEA Science Study, 1988.

Data from the Second International Mathematics Study (1982) show that the performance of the top 5 percent of U.S. students is matched by the top 50 percent of students in Japan. Our very best students—the top 1 percent—scored lowest of the top 1 percent in all participating countries.[19]

Figure 7

U.S. Advanced Science Students

In 1986, U.S. students who were completing a second year of study in biology, chemistry, or physics were administered a test in their specialty area.



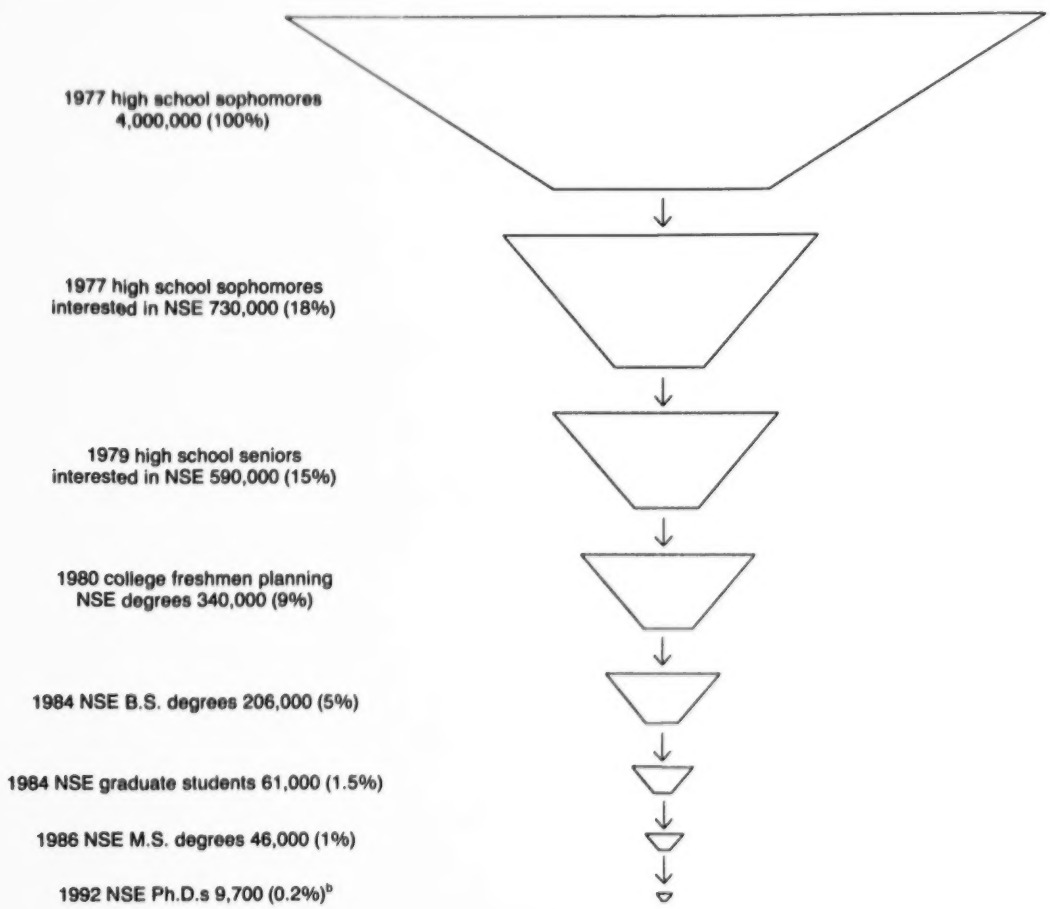
SOURCE: Second IEA Science Study, 1988.

Another way to look at science achievement is to compare the numbers of students who study science and the numbers of years devoted to it. Bill Aldridge, Executive Director of the National Science Teachers Association, reports that compared to countries like the USSR and the People's Republic of China, a smaller percentage of secondary school students in the U.S. study biology, chemistry and physics and that those who do take these subjects spend less time on them.[20]

Of 1987 U.S. high school graduates, nine in ten took biology, about half took chemistry and one fifth took physics.[21] Meanwhile *all* students in the USSR and China take several years of biology, chemistry and physics. Table 5 compares the amount of time spent on these subjects by the average student in the USSR, China and the U.S. "The student in the USSR or

Figure 8

NATURAL SCIENCE/ENGINEERING[a] PIPELINE: FOLLOWING A CLASS FROM HIGH SCHOOL THROUGH GRADUATE SCHOOL


1977 high school sophomores
4,000,000 (100%)
1977 high school sophomores
interested in NSE 730,000 (18%)
1979 high school seniors
interested in NSE 590,000 (15%)
1980 college freshmen planning
NSE degrees 340,000 (9%)
1984 NSE B.S. degrees 206,000 (5%)
1984 NSE graduate students 61,000 (1.5%)
1986 NSE M.S. degrees 46,000 (1%)
1992 NSE Ph.D.s 9,700 (0.2%)[b]

[a] Natural science/engineering (NSE) includes physical, mathematical, and life sciences, and engineering, but not the social sciences.

[b] National Science Foundation estimate, based on the historical rate in NSE of 5 percent of B.S. graduates going on for Ph.D.s (using an 8-year average lag time from B.S. to Ph.D.). If market conditions increase demand for Ph.D.s, then this estimate may understate future production of NSE Ph.D.s. The number of NSE Ph.D.s in 1986 was about 12,000, or over 7 percent of NSE B.S. graduates in 1978 (Center for Education Statistics degree data). Assuming 7 percent of 1986 B.S. graduates rather than 5 percent go on for Ph.D.s would project 14,400 NSE Ph.D.s in 1992 rather than 9,700. Other methods of prediction (for instance, estimating Ph.D.s as a percent of the 30-year-old age cohort) show similar responsiveness to changing participation rates and assumptions. The Ph.D. population is very small and responds to changing conditions in academia and the job market, so that population-based estimates should be taken as rough indicators or warning signals rather than as solid predictions.

NOTE: These National Science Foundation estimates indicate the general pattern of the NSE pipeline, but are not actual numbers of students in the pipeline. (For instance, actual natural science/engineering B.S. production was 209,000 in 1986, Center for Education Statistics data). The estimates are based on data from the U.S. Department of Education-sponsored National Longitudinal Study of 1972 seniors (for the high school senior through graduate school transitions) and High School and Beyond Study of 1980 Seniors (for the high school sophomore to high school senior transition). Since the National Longitudinal Study was conducted, student interest in NSE majors has risen, but it is not yet clear whether trends in student interest with time will follow the pattern of 1972 high school seniors revealed by the National Longitudinal Study.

SOURCE: National Science Foundation.

China spends almost twice as much time studying physics than his or her American counterpart." And, according to Aldridge, the dropout rate in these countries is only about 2 percent compared to our 25 percent.[22]

Table 5
TIME SPENT ON BIOLOGY, CHEMISTRY AND PHYSICS

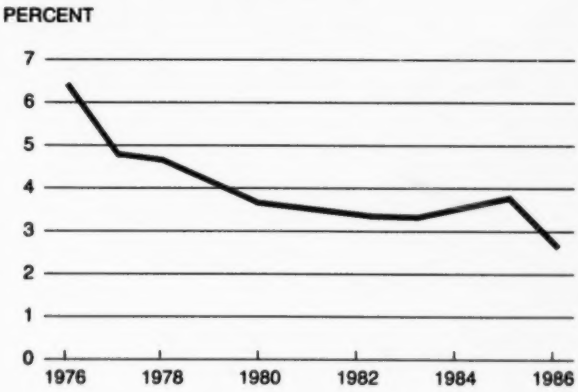
	U.S.	USSR	PRC
Biology	180 hours 1 year	321 hours 6 years	256 hours 4 years
Chemistry	180 hours 1 year	323 hours 4 years	372 hours 4 years
Physics	180 hours 1 year (21%)	492 hours 5 years	500 hours 5 years

SOURCE: National Science Teachers Association

Figure 8 illustrates how the educational system acts on students to sort and guide them to science and engineering careers.[23]

Not surprisingly, students are also expressing declining interest in mathematics as is illustrated in Figure 9.[24]

Figure 9
INTENDED MATHEMATICS MAJORS OF TOP HIGH SCHOOL SENIORS



Since 1975, the percentage of top high school seniors who expressed an interest in majoring in mathematics or statistics has declined by over 50 percent, even as the corresponding percentage for science and engineering remained relatively constant.

SOURCE: National Research Council

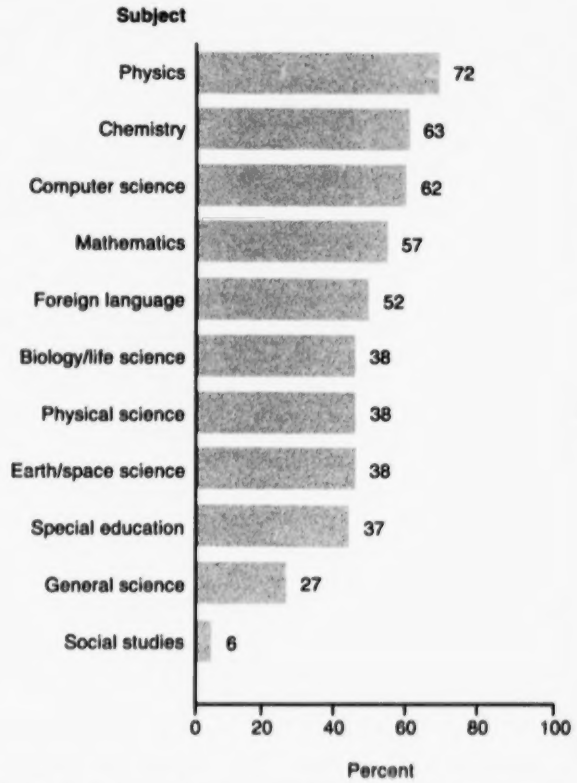
Finally, there is a question about who is going to prime the pipeline, as principals report having difficulty filling teaching positions in math and science subject areas. The lack of qualified teachers to create enthusiasm for science and develop the interest and ability of students further squeezes the pipeline of potential workers (see Figure 10).[25]

Perhaps the most significant indicator of how well our schools are doing is the experience of employers. A 1989 survey of the FORTUNE 500 companies indicated that 55 percent of the 213 industrial companies responding to the survey are having a problem hiring workers with basic educational skills, as are 62 percent of the 191 service companies which responded. The service companies also reported a greater degree of difficulty in finding workers.[26]

Of over 400 FORTUNE 500 companies which responded to the survey, more than one-third offered their employees remedial courses to improve reading, writing and math.[27] It is estimated that as much as a quarter of the American labor force is illiterate and that functional illiteracy costs business over $6 billion annually in lost productivity. A 50 percent functional illiteracy rate is projected by the turn of the century.[28]

Figure 10

PERCENT OF HIGH SCHOOL PRINCIPALS WHO REPORT DIFFICULTY IN HIRING FULLY QUALIFIED APPLICANTS FOR TEACHING VACANCIES, BY SUBJECT: SCHOOL YEAR ENDING 1986



SOURCE: National Science Foundation, National Survey of Science and Mathematics Education, 1985–86

CHAPTER 2

Implications of These Findings for the Country and the Company

When school performance is studied in light of labor demands and demographic trends, serious deficiencies can be observed. We are not educating enough students well enough to meet labor needs. The students being served least well by the schools are members of groups which are increasing at the fastest population growth rates. U.S. Secretary of Education Lauro Cavazos has referred to the condition in education as a national tragedy.

Given the information available now, we looked at the implications of the findings for the country and the company.

IMPLICATIONS FOR THE COUNTRY:

At the very least, we have an undereducated population which keeps this nation from realizing its highest economic potential. More likely, we face a threat to our international competitiveness and to our standard of living.

The growing mismatch between educational and skill levels of new workers and the country's labor needs is a constraint on productivity and economic growth. Increases in our nation's productivity must keep pace with or exceed those of other nations if we are to compete in the global market. To enjoy a rising standard of living our industry must be able to develop and expand as fast as world and domestic markets allow.

Among post-industrial nations, people, their knowledge and ability, are increasingly becoming a country's most important assets. In order to maintain our competitive position in the world, we need to develop our human capital fully.

The low ranking the U.S. received on the international comparison of science scores is of particular significance for our ability to compete internationally. As John Clendenin, CEO, BellSouth Corporation said, "If you don't have workers with strong math and science backgrounds, you don't have the edge in technology. And if you don't have the edge in technology, you don't have the competitive edge." The fact that other nations are doing a better job educating their young people is reflected in those countries' gains in the world marketplace.

The failure to produce a more highly skilled workforce will mean further direct losses for this country in the international marketplace. There will also be the harder-to-define opportunity lost—the incalculable losses from industries' undeveloped productivity, improvements unrealized, and human potential unfulfilled. The loss of wages, profits and productivity caused by the skills deficit has already cost businesses and taxpayers an enormous sum.[29]

Lost opportunity is but one of the costs of a gap between the qualifications of potential workers and job demands. A shortage of qualified workers also drives up labor costs due to stronger competition for the more highly educated or skilled individuals. Remedial education and training, which industries provide to compensate for the lack of skills among workers, is another expense. It is estimated that productivity losses caused by poorly trained workers and remedial training cost industry about $25 billion a year.[30] This

is a cost some of our competitor nations do not have.

There are also the costs to the country of unemployment and poverty on top of the loss of earnings and tax revenue.

Students who do not complete high school are more likely to be unemployed than students who stay in school. In 1985 the national unemployment rate for 16 to 24-year-old high school graduates was 10 percent. The unemployment rate for dropouts of the same age was 25 percent.[31]

On the positive side, the declining number of new entrants into the workforce means that there can be jobs for a greater percentage of potential workers. If we can find a way to educate disadvantaged groups in our society, there will be jobs for them. This is an opportunity not to be missed.

If we do not act, however, we may well experience a slowly growing economy, with a society which has an increasing gap between a shrinking group of well educated, much-in-demand people and a growing group of undereducated, unemployable people. This is a scenario for social unrest.

IMPLICATIONS FOR THE CORPORATION:

For Union Carbide the undereducated and stagnant or slowly growing U.S. workforce has several ramifications. The most direct impact is that we can expect to have increasing difficulty and expense in meeting our own labor needs both in critical fields like science and engineering and at the hourly worker level.

Even if we were to experience no recruiting difficulty, we would be impacted by the difficulties felt by our customers and suppliers. If an undereducated workforce affects the economy as a whole, we will suffer too since 70 percent of our business is domestic. As a purchaser of services and supplies, we will pay indirectly for the remedial education which our vendors must offer. As a seller, if our customers lose business, we will too. As a taxpayer, we will face a growing burden of social programs relating to unemployment of unskilled workers—the costs of poverty, crime and ill-health. And finally, our ability to plan and grow would be hindered if the country developed an unstable social environment.

Of major concern to Union Carbide is the shrinking pool of engineering and science graduates. Over the past three years, since our major divestment, Union Carbide has filled over 200 entry-level positions each year with recruits holding Ph.D., master's and bachelor's degrees. Well over three-quarters of the total new hires hold degrees in science or engineering.[32]

These are two of the fastest-growing employment fields in the U.S. Yet, the number of undergraduate degrees is expected to decline over the next several years. The number of U.S. students receiving bachelor's degrees in engineering peaked in 1986 at 78,000 graduates. It is projected to fall to 65,000 by the year 2000.[33] The total number (includes awards to non-U.S. students) of bachelor's degrees in the physical sciences peaked in 1982 at 24,000. Preliminary data for 1987 shows that under 20,000 degrees were awarded.[34] This drop in the number of degrees at the bachelor's level will be reflected in the number of master's and Ph.D. candidates in succeeding years.

It is also worth noting that foreign citizens make up more than half of the engineering graduate students, most of whom hold temporary visas and will return to their home countries. More engineering Ph.D.s are awarded to foreign-born students than to U.S. citizens. About 60 percent of these students remain here.

The drop in degree production is a consequence of both the shrinking size of the pool of potential students and of decreased interest on the part of college students in science and engineering majors. Historically, market forces have corrected the shortages. A look at the demographics and the low math and science scores in the elementary and secondary levels, however, leads to the conclusion that an increasingly tight labor market may be a long-term and expensive problem.

UCC is already experiencing a tighter labor market at the Ph.D. recruiting level. Competition for Ph.D.

talent is keener and, as a result, increases in our starting salaries have outpaced the rate of inflation during the last two years. According to W.P. Samuels, Ph.D., recruiting manager and member of the UCC Education Task Force, there is also a general feeling of "erosion of quality" in new Ph.D.s.

According to L.J. Derzansky, manager of Union Carbide Chemicals and Plastics Professional Employment Department, a similar pattern is occurring at the master's and bachelor's levels. Furthermore, the bigger supply of and lower demand for B. S. chemical engineers two years ago meant that we were able to recruit graduates with higher grade point averages.

This pattern is at present partly a reflection of Union Carbide's position in the current business cycle. Market forces have traditionally corrected these labor shortages. However, the shrinking number of 16 to 22-year-olds, combined with decreased student interest and preparation in the sciences, portend an extended period of scarcity.

Our year 2000 "fresh-out" recruits are already in the pipeline. For an idea of how many candidates we will have to choose from and how well prepared they will be, look at what is happening in the elementary and secondary schools. It is the schools that interest and prepare, or fail to prepare, students with the necessary backgrounds in science and mathematics and therefore have the greatest influence on the size and quality of the science and engineering workforce.

This is why the poor achievement scores and low participation levels in math and science are cause for alarm. The lower performance by minority youngsters in these subjects adds to the feeling of urgency because these students will make up a larger percentage of the future workforce. Without solid foundations in math and science, students lose interest or are not prepared to continue on in these and related fields.

In addition to professional workers, we should also be concerned about the supply of qualified hourly workers and support staff. While not yet a problem for UCC in communities still experiencing high unemployment, there are indications of scattered shortages of such workers at some of our smaller facilities in geographical areas with low unemployment.

From a strictly business point of view, does it really matter to Union Carbide if the labor pool in the U.S. is undereducated? What is wrong with importing the talent or moving operations to where labor is? We are a world-wide company. Is the education issue a business issue or a nationalistic issue?

We are—and may step up—importing the top talent that we need. If U.S. industries import talent, we displace U.S. workers who, if qualified, could have had the jobs. We increase the pool of unemployable or inappropriately employed labor which becomes a cost to society and business. If smaller companies cannot afford to bring in labor to meet their needs, they will become uncompetitive and constrain domestic economic growth.

The bottom line is that we have huge capital investments in the United States and a $5.8 billion stake in the U.S. market. We would be concerned about the U.S. market even if we were not headquartered here. The education issue affects the health of the U.S. economy and thereby becomes a business issue for Union Carbide.

As a taxpayer, Union Carbide and other businesses could gain by improved education. We would lower welfare costs, slow the rate of crime, increase buying power of the fully employed and increase tax revenue from earnings. There would be reduced cost for remedial education and training, and taxes to support social programs for the unemployed. Corporations pay billions of dollars in local and state taxes across the nation. A large portion of these taxes is used to support public education.[35] If we have to incur cost of remedial training and education, we pay twice.

Finally, we are already seeing the price of decisions and opinions of an uninformed public. Legislative and regulatory mandates based on too little information or misinformation are costly. As Harvard President Derek Bok said, "If you think education is expensive, try ignorance."

CHAPTER 3

What Needs to be Done

We need to more highly educate a greater percentage of our population if we want to improve opportunities for U.S. industry internationally. This means increasing student achievement levels across-the-board and reaching students who currently are not served well by schools.

These goals are not new. Much attention and money has been directed at improving student performance. Expenditures per pupil have increased 60 percent over the past 20 years (see Figure 11).[36] Achievement gains over this same time period have been minimal.

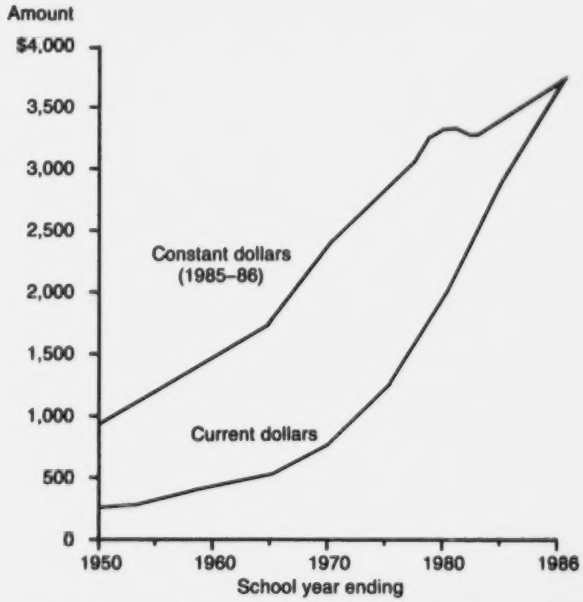
One problem is that the structure of schools has not changed for almost 100 years. Back then it was not necessary, or even desirable, to highly educate everyone. We must reach for this goal today. But we have a system in place that is incapable of producing the quality education we need today.

The school system was originally designed for a society that needed unskilled workers. Not everyone was expected to have strong reasoning skills and a high level of knowledge. The economy had a place for those students who did not complete high school. The term "dropout" did not exist since only a small percentage of students graduated. It was not until the 1950s that the majority of students completed high school.

The school system is still set up along a "factory floor model" as it was in the late 19th century. The organization of schools emulates the industrial organization of that time. As a result, teachers are given little decision-

Figure 11

TRENDS IN CURRENT EXPENDITURE PER PUPIL IN AVERAGE DAILY ATTENDANCE IN PUBLIC SCHOOLS: SELECTED SCHOOL YEARS ENDING 1950–1987



SOURCE: National Center for Education Statistics. *Statistics of State School Systems and Revenues and Expenditures for Public Elementary and Secondary Education.* Common Core of Data survey. National Education Association, *Estimates of School Statistics*

making authority, students are often treated as passive products and, too often, rote skills are emphasized over creative problem solving.

To accomplish today's educational goals, schools need to be overhauled. Minor improvements in the existing system are not going to make a significant difference. Schools must be restructured to accommodate modern economic structure and its increased performance demands. Education thought leaders agree on what should be done to make schools more productive. They warn, "Don't tinker, go for major systemic reforms."

The basic thrust of the major proposals for overhauling education reflect modern business practices. Reform measures are directed at bringing decision-making down, closer to the "student-product" and establishing clear goals and measures of performance. They involve flattening school bureaucracies and removing restrictive regulations which smother individual educator initiative. The basic components of school reform are:

- **ESTABLISHING SCHOOL AUTONOMY AND EMPOWERING PRINCIPALS AND TEACHERS BY PROVIDING SCHOOLS WITH DISCRETIONARY FUNDS AND EXPANDING TEACHER RESPONSIBILITIES.**

  A Brookings Institution study of 500 public and private schools identified factors which were related to student achievement gains in schools. In successful schools, the main organizational difference was degree of autonomy. The freer the school was from external control by administrators, unions and school boards, the more likely it was to be effective. The study showed that the more you regulate schooling, the more you "mess it up."[37]

  In the successful schools, teachers were trusted to make their own judgments. They were involved in school decision making and cooperated with each other. Principals need to have budget prioritizing and spending authority and should be able to select teachers. Now these functions are often performed by the superintendent's office.

  Unleashing the teaching and administrative talent that we already have in the schools would be one of the most cost-effective steps that could be done to move education forward. The teachers must be in a position to change the system to accommodate the differences in students.

- **STRENGTHENING THE TEACHING PROFESSION BY REWARDING PERFORMANCE AND RESPONSIBILITY BY UPGRADING TEACHER PREPARATION, AND MAINTAINING HIGH STANDARDS.**

  A strengthened teaching profession would make it more attractive to new recruits and improve the morale of all educators. And it would mean better teaching.

  New categories of teachers should be added to the existing teaching force so that there is a multi-tiered teaching system. Teachers on the higher tiers would be proven high performers, who would be given more responsibility and broader function.

  They would act in a support role as a resource and guide for less experienced teachers. Rising salary rates would follow the tiers and be tied to the success of the school in producing effective graduates.

  Teacher preparation programs need to be reformed. Teachers should graduate from a regular four-year college before they start teacher preparation. Then they should complete a one-year master's program in teaching and learning followed by a year-long internship in a professional development school.

  To maintain high professional standards, teachers should be evaluated on a regular basis throughout their careers. Performance should be judged on the basis of results and not on the ability to follow procedures. Some system to ensure periodic update of skills should be established.

- **INCREASING PARENTAL INVOLVEMENT IN THEIR CHILDREN'S SCHOOLING. GIVING PARENTS A CHOICE OF SCHOOLS AND SCHOOLING APPROPRIATE FOR THEIR CHILDREN INCLUDING SMALL-SCHOOL, FLEXIBLE ENVIRONMENTS.**

  Parental involvement in their children's schooling is one of the most important factors relating to student progress. Yet, parental involvement is sorely lacking—partly because parents are busy and partly because there is no meaningful, established role for parents in the school program.

  Close contact with the school is the only way to really know what is going on and the only way to gain enough information to determine satisfaction with the system.

  Giving parents a choice of schools is the most talked about catalyst for changing education. By introducing competition into the system, schools would have a reason to communicate with the parents and parents would have a reason to be involved with the schools.

- **RAISING ACADEMIC EXPECTATIONS FOR *ALL* STUDENTS AND MODERNIZING INSTRUCTION PRACTICES TO INCREASE LEARNING.**

  "Changing demographics have raised the stakes for all Americans. Never before have we been forced to provide true equality in opportunity to learn. The challenge we face today is to achieve what we believe."[38] Universal education has long been a goal in the U.S., but we have never achieved it. Poorly implemented tracking systems have resulted in lowered expectations and lowered performance among non-college-bound students.

  All students should be expected to learn. Non-college-bound students should still receive high academic training because the emerging economy demands it.

  Instructional strategies exist that enable most students to achieve at high levels in contrast to traditional teaching methods which focused on the top 20 percent. These strategies should be widely implemented.

  Computer-assisted learning should be more fully explored.

- **DEVELOPING CLEAR SCHOOL GOALS AND MEASURES OF ACCOUNTABILITY AND FOCUSING ON CORE ACADEMICS IN GRADES 1-10.**

  As the saying goes, "If you don't know where you are going, you won't get there." Most schools and school systems "don't know where they are going."

  Clear goals for schools need to be established and then measures of accountability determined. The successful schools in the Brookings study had clear visions and goals focused on academic performance.

  Elementary and secondary education should concentrate on the core subjects, including science. This core curriculum should be mastered by age 16 or grade 10. In grades 11 and 12 students should be able to start to tailor their education to their early career aspirations.

- **OFFERING EARLY CHILDHOOD PROGRAMS TO ECONOMICALLY AND CULTURALLY DISADVANTAGED CHILDREN TO HELP THEM OVERCOME LIMITATIONS TO LEARNING.**

  Research has shown that providing early childhood programs to disadvantaged students is a good investment. The purpose of the program is to give the students a better start in first grade and to prevent them from falling behind their peers. No other program we looked at had the universal support of the Head Start programs.

Figure 12 shows how the investment pays off in later years by saving society the costs of welfare, crime, additional education and the loss of tax revenue.[39]

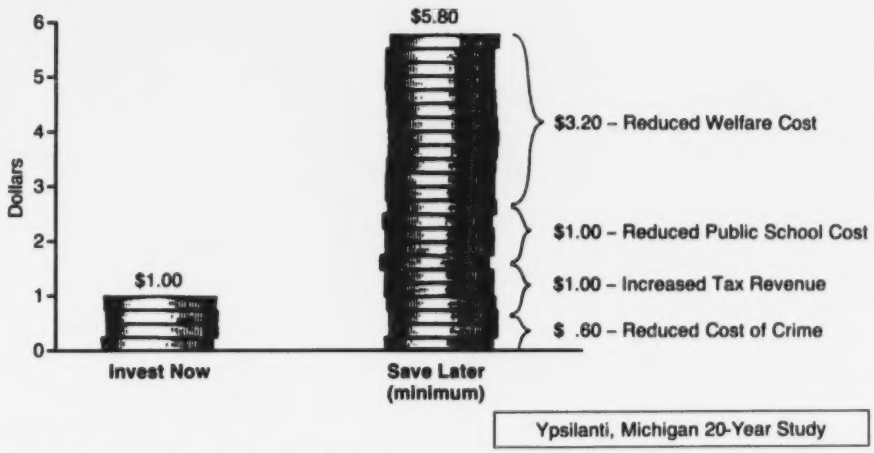
- **MAKING ENGLISH AND FOREIGN LANGUAGE PROFICIENCY REQUIRED OF ALL.**

  Language handicaps erode self-esteem and prevent school achievement. All students should be proficient in English.

  Native English-speaking students should be required to master a second language.

Figure 12

PRESCHOOL INVESTMENT YIELDS HIGH RETURNS



SOURCE: California Business Roundtable, 1988

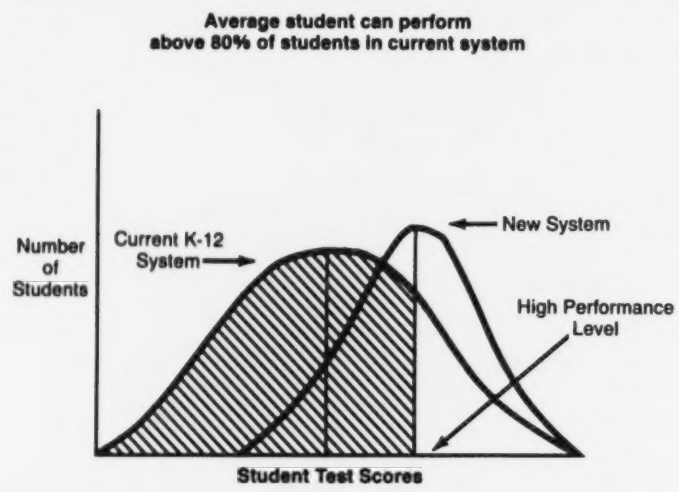
A California Business Roundtable study estimates that, under a new school structure, the average student could perform above 80 percent of students in the current system (see Figure 13).[40]

The curve on the left represents the distribution of scores on California standardized tests under current teaching practices. The curve on the right illustrates how researchers feel scores could be distributed if different teaching methods are used. Projections are based on practice in thousands of classrooms across the country using methods of instruction called "mastery learning" and "cooperative learning."

Mastery learning "begins with the assumption that all students can learn given sufficient time and teaching methods that fit childrens' learning styles."

Cooperative learning refers to small groups of children of varying abilities assigned to work together to achieve a common goal. Cooperative learning strategies attempt to maintain individual accountability while encouraging group responsibility.

Figure 13
MORE STUDENTS CAN LEARN MORE


Average student can perform above 80% of students in current system
Number of Students
Current K-12 System
New System
High Performance Level
Student Test Scores

SOURCE: California Business Roundtable, 1988

CHAPTER 4

Obstacles To Change

Since there appears to be a good understanding of what needs to be done, why has so little change taken place? The Task Force identified a number of obstacles which get in the way of significant education reform.

- **ENTRENCHED EDUCATIONAL BUREAUCRACY:**

  Perhaps the biggest barrier to change is that there are 16,000 school systems in the country, each with its own bureaucracies and almost a century of experience under the current structure. As with any entrenched organization, it is resistant to change and momentum cannot come from inside. Educators with vision are asking for help from without.

- **LOW PUBLIC AWARENESS AND UNDERSTANDING OF THE CRISIS IN EDUCATION:**

  There is low public awareness of what the education issue is all about. Blame for what is perceived as poor school performance is often misdirected at teachers and administrators rather than the system. Efforts to bring about improvement are misguided due to lack of understanding about what is necessary to improve the "student-product."

  It is particularly difficult to inform people about the status of education because almost everyone has had personal experience with the schools and has an individual opinion based on history. A large group relates positively to memories of the school system, which distorts their view of education and impedes action. For change to take place, there must be deep dissatisfaction coupled with a force of sufficient intensity to keep moving toward the vision.

- **LACK OF SIGNIFICANT PARENTAL INVOLVEMENT IN EDUCATION:**

  Parents today are not as involved in their children's education as their predecessors. Without close contact with the schools, parents cannot monitor either teachers or children. Lack of information means that parents do not pressure the system for improvements, nor do they give accolades for performance. Inattention provides no stimulus for change.

- **DECREASING PERCENTAGE OF THE POPULATION HAS CHILDREN:**

  Fewer people with children means that there is a shrinking political base for support of education and increased competition for societal resources with older segments of the population. Fewer people having a direct interest in education makes it more difficult to develop momentum for change.

- **LACK OF CLEAR GOALS AND MEASURES OF ACCOUNTABILITY:**

  One of the reasons it is so difficult for parents to get a perspective on how well children are doing

is that they do not know what the children are *supposed* to do. Without clear goals there are no grounds on which to question lack of student attainment.

Goals are also needed so measures of teacher accountability can be established. Performance criteria are the fuel for change.

- **CHANGING ATTITUDES:**

  While intangible and not quantifiable, there is a pervasive feeling that one of the biggest obstacles to education reform is our public "attitude." Bred on television and passive learning and accustomed to instant gratification without hard work, many students are unwilling to tackle subjects requiring effort. Other young people caught in the cycle of poverty have lost sight of education as a means to a better life.

  Parents have lost the authority or the will to motivate their offspring or are too tired to exercise either. The work ethic is weak—a victim of its own success in earlier generations.

- **INFLUENCE OF SOCIAL PROBLEMS:**

  Antisocial activities (crime and drugs) and unstable home environments are often mentioned as factors which will undermine efforts to improve student performance. These social problems, however, should be viewed as part of a cycle and not solely as a "cause" of educational difficulties.

  Arrest rates, teen pregnancy and adult poverty rates inversely correlate with high school graduation rates. Education is the major defense against increasing social problems. To eschew efforts to improve student achievement until social problems are addressed is to try to smother a fire with a blanket of oxygen.

- **CUMBERSOME SYSTEM FOR SCHOOL FINANCE AND GOVERNANCE:**

  As efforts have been made to improve school performance within the old system, more and more regulation and bureaucracy has been added. There are so many points of governance that creativity and innovation are stifled.

- **PUBLIC EDUCATION IS A MONOPOLY:**

  No matter how well or how poorly a school educates students, there is a new supply of "customers" each year. Most systems do not allow parents to send children to a school outside the one that has been assigned. Schools have captive clients and barring a significant drop in enrollment, the institution's survival is assured.

CHAPTER 5

Proposed UCC Response

Catalysts for education reform must come from outside the system. Educators with vision are asking for help from without.

And this is an appropriate role for business to play. Union Carbide has a major investment in the system and an obligation to make sure it performs optimally. We need to join forces with other businesses and organizations in making change happen.

The Union Carbide Corporate Task Force on Education recommends that UCC join other businesses and organizations in addressing the school issues.

SPECIFICALLY, THE TASK FORCE RECOMMENDS THAT UCC:

Support and initiate programs designed to bring down the barriers to school reform and to stimulate change. These efforts should be directed both externally, to the general public and internally, to our employees.

THE CORNERSTONES SHOULD BE:

1. A powerful information campaign to change public attitudes toward education.

UCC would take a leadership role in coordinating a massive effort to raise public expectations similar in scope to the national AIDS and smoking awareness efforts.

UCC could work through The Business Roundtable, The Advertising Council and/or through a new coalition of business and other organizations. The objective of the campaign would be to create a climate for change by building a public vision of what can be. Impact of campaign would be assessed.

R.D. Kennedy would include the education message in speeches and public appearances.

Campaign could include replication of the UCC "Emerging Education Issues Forum" in key Carbide communities as a means of sensitizing employees and local thought leaders to the need for reform and ideas for change.

2. Leadership role in creating a national coalition to establish educational goals.*

Education today is like an industry unclear about its product and, therefore, unable to practice quality control. There is no definition of an educated person and thus no way to evaluate school performance. Without clear goals by which progress can be determined, school reform efforts remain fragmented and momentum diffused.

There is a need for national goals by which state school performance can be measured. Currently there are no funds dedicated to this purpose and, more significantly, it's nobody's job.

A major barrier to education reform would be removed if a non-governmental coalition of business, educators and political leaders developed the yardsticks for measuring how well states are doing. The group might be known as the National Coalition for Educational Excellence.

**Since the writing of this report, the National Governors Association has taken the lead to establish national goals. Union Carbide activities in pursuit of educational goals will be coordinated with the National Governors Association effort.*

This effort should not be confused with creating a national curriculum. What to teach and how to teach it would be state and local options. The national framework would be defined in functional terms—what the student should be able to do.

3. Bold demonstration programs of school reform in two Carbide communities. UCC would sponsor models for major school restructuring. Results would be shared with the nation.

Models would be built around principles of teacher autonomy, parental involvement, school-based management, raised expectations for academic performance, clear goals and measures of accountability and would have a "results orientation" rather than a "process orientation." There would be a "mentor" component in which active or retired Carbide volunteers would pair up with "at risk" students and provide support and encouragement.

One possible model is that of a school in Köln, West Germany, which has a diverse population similar to many U.S. enrollments. In this program, teacher potential is unleashed by organizing teachers into "teams" of six to eight teachers. Each team of teachers is assigned to three classes of students for six years (from ages 10 to 16).

Teachers are encouraged to schedule their own days. Their performance is judged by outcomes. The long association with the same students prevents teachers from blaming student failures on teachers of the past. The continuity of association also enables the educators to get to know students' families and to establish student relationships not possible in most systems today.

Expectations would be for broad and significant increases in student achievement, higher school retention, percentage increases in college-bound students and higher skill-level placement of vocational students, raised teacher morale and professionalism and greater parental support.

To determine with which communities to work, UCC could put our proposal "out-to-bid" in locations in which we have a major presence and stake in the output of the schools. The systems which make us the best offer of community cooperation, willingness to experiment and desire for partnership would be selected. This method is designed to overcome the political obstacles to change.

4. A rigorous and high-profile internal information program directed to raise employee awareness of the education issue and to encourage parents to become more active in their children's schools.

Employees are involved in their communities and help make local policy. They are a captive audience for information and their understanding of the education issue makes a difference. Incentive programs should be devised to increase employee representations on local school boards. Full and in-depth preparation for school board involvement should be offered.

COMPLEMENTARY ACTIONS:

While these four undertakings would constitute the main thrust of the UCC effort, the Task Force identified additional programs which would complement and round out the involvement. They are:

1. Incentive programs for teachers in Carbide communities to become "Board Certified."

This new voluntary opportunity will be run by the National Board for Professional Teaching Standards and will be offered for the first time in 1993. This board certification program is meant to parallel the credentials offered in other professions like medicine and law. Teachers will undergo classroom observations and sophisticated new tests of their expertise.

2. Political support of legislative changes in key Carbide states and at the national level which favor school reform, such as deregulation of education, alternative routes to teacher certification and full funding of Head Start programs.

In order to bring about drastic change in education, the regulations obstructing movement have to be repealed. New roles have to be defined for states so they

become monitors of outcomes, not procedures. Opportunities for experimentation and revitalization may have to be authorized by law.

3. An internal program which would facilitate a mid-career switch to teaching for interested Carbiders and/or would allow for teaching assignments with simultaneous Carbide responsibilities.

Carbide employees tend to have backgrounds in subject areas with teacher shortages. States are beginning to allow "alternate routes to certification" for people with subject matter expertise but no teacher training. Matching employee skills with community needs would not only nourish educational resources, but would help strengthen the relationship between schools and industry.

4. Financial support and promotion of programs to enhance math and science teaching skills at the elementary level in key Carbide communities.

The strength of the math and science skills developed at the elementary and secondary levels greatly influences the number of young people who continue on in these fields. Efforts to enhance the skills of elementary teachers in these subject areas should go along simultaneously with the restructuring effort.

5. Financial support of programs to address potential teacher shortages and to reform teacher preparation programs.

Over the next 10-15 years we will replace virtually all the 2.3 million teachers in our schools.[41] This turnover not only provides an opportunity to energize the teaching profession, but also indicates a need to attract a lot of new individuals to teaching.

NEW INITIATIVES MUST BE IN ADDITION TO CURRENT UCC PROGRAMS:

The Task Force recognizes the extended time horizon required to demonstrate results. During the interim, we must continue to aggressively support complementary programs that are more short term and UCC-return focused. Programs such as INROADS, summer internships, co-ops, college relations liaisons, university/college financial contributions, upward mobility efforts, continuing employee education and development, and many others must be supported to assure ourselves that we are gaining a maximum return on our "people capital."

The Task Force acknowledges that as UCC takes on a more public and leading role in the educational reform movement, it must be able to credibly withstand an internal review of those human resource systems that we alone control. We believe that we will become more comfortable in our new advocacy role as positive strides within UCC continue to be made in these areas.

IMPLEMENTATION MECHANISMS:

The Task Force believes that the issue of public education deserves bold, meaningful action on the part of Union Carbide—or none at all. To dabble in the problem will not significantly improve school performance and will not be an efficient use of UCC resources.

To make an impact, UCC's commitment to the recommended projects must be long term...not less than 10 years. We feel strongly that the implementation mechanism must provide continuity and stability to the program both in terms of the staff time and financial resources.

There is no limit to the amount of money that could be devoted to the course of action outlined above. Projected costs can be determined once a general course of action is endorsed. A second phase of the Task Force's work will be to flesh out tactical issues and estimate budget and human resource requirements.

The Task Force suggests that the program be funded through the corporate contributions budget. This would be consistent with the proposed 1990-95 Philanthropic Investment Plan.

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RESEARCH PROCESS

In December, 1988, Robert D. Kennedy, Union Carbide Chairman and Chief Executive Officer, established the Union Carbide Task Force on Education to study public education in the United States and to determine the implications for Union Carbide.

For the past six months, to gain a broad understanding of the education issue, the Task Force gathered information by means of an extensive research effort. In addition to reviewing a wide variety of publications and documentaries, numerous in-depth interviews were conducted. On a continuing basis, members of the Task Force met to review and discuss the information gathered. The evolving analysis and proposals resulted in the evaluations and recommendations presented in this report.

The following describes in large part our search process.

FORUM ON EMERGING EDUCATION ISSUES. . .

The Task Force hosted a forum at the Union Carbide Center (Danbury, Connecticut), April 3-5, 1989, on emerging education issues. More than 65 persons attended. Included, along with the members of the Corporate Task Force on Education, were Union Carbide representatives from key community locations, local school superintendents and others from Carbide communities.

The presenters and panelists are some of the foremost thought leaders in the country:

John E. Chubb, Ph.D.
Senior Fellow
The Brookings Institution
Washington, D.C.

Denis P. Doyle
Senior Research Fellow
Hudson Institute
Indianapolis, Indiana

Jackie Ducote
Executive Vice President
Louisiana Association of
Business and Industry
Baton Rouge, Louisiana

Lewis W. Finch, Ph.D.
Superintendent of Schools
Anoka-Hennepin Independent
School District
Coon Rapids, Minnesota

Seymour Fliegel
Former Deputy Superintendent
Community School District 4
East Harlem
New York, New York

Charles W. Fowler, Ph. D.
Superintendent of Schools
Sarasota, Florida

Joseph Nathan, Ph.D.
Humphrey Institute of
Public Affairs
University of Minnesota
Minneapolis, Minnesota

Paul M. Ostergard
President
General Electric Foundation
Fairfield, Connecticut

Mitchell B. Pearlstein, Ph.D.
Director of Outreach
U.S. Department of Education
Washington, D.C.

Diane S. Ravitch, Ph.D.
Adjunct Professor of History and Education
Teachers College
Columbia University
New York, New York

Phillip C. Schlechty, Ph.D.
President
Center for Leadership in School Reform
Louisville, Kentucky

Albert Shanker
President
American Federation of Teachers
Washington, D.C.

Arthur E. Wise, Ph.D.
Director
Center for the Study of the Teaching Profession
The RAND Corporation
Washington, D.C.

Robert L. Woodson
President
National Center for Neighborhood Enterprise
Washington, D.C.

John Zysman, Ph.D.
Professor and Co-Director of BRIE
(Berkeley Roundtable on the International Economy)
University of California
Berkeley, California

SMALL GROUP MEETINGS AND PERSONAL INTERVIEWS...

Throughout the six-month period a series of small informal meetings and personal interviews were held with educators and education thought leaders. These included discussions with:

Joseph (Steven) Bickford
Superintendent of Schools
Roxbury, Bridgewater, and Washington, Connecticut

Ernest L. Boyer, Ph.D.
President
The Carnegie Foundation for the Advancement of Teaching
Princeton, New Jersey

John R. B.-Clement
Senior Program Officer
National Research Council
Washington, D.C.

Edward P. Fiske
Education Editor
The New York Times
New York, New York

F. James Hoffman
Director
The Principals' Leadership Institute
Fairfield, Connecticut

Willard J. Jacobson
Professor Emeritus of Natural Sciences
Teachers College, Columbia University, and National Research Coordinator
Second International Science Study
New York, New York

Donald P. LaSalle, Ph.D.
President
Talcott Mountain Science Center
for Student Involvement, Inc.
Avon, Connecticut

Michael Perrone, Ed.D
Superintendent of Schools
Brookfield, Connecticut

John Reed, Ed.D.
Superintendent of Schools
Newtown, Connecticut

Anthony Singe, Ph.D.
Superintendent of Schools
Danbury, Connecticut

Steven Tracy, Ed.D.
Superintendent of Schools
New Milford, Connecticut

This study also profited from information shared by numerous educators, Union Carbide employees, business and industry executives and others concerned and involved with education.

OTHER EDUCATION ISSUE CONFERENCES. . .

Additional insight into the issue was provided by public- and private-sector experts at education conferences. These include:

Allstate Forum on Public Issues
"Labor Force 2000"
Washington, D.C.
April 20, 1989

The Business Roundtable
"Annual Meeting—Special Program on U.S. Education"
Washington, D.C.
June 5, 1989

The Conference Board
"Business Leadership: The 3rd Wave of Education Reform"
New York, New York
February 14, 1989

The Heritage Foundation
"Can Business Save Education?"
Washington, D.C.
February 22-23, 1989

The National Conference of State Legislatures
"Education Finance Issues Confronting State Legislatures"
Atlanta, Georgia
May 18-20, 1989

SYNOPSIS

UNION CARBIDE CORPORATION FORUM ON EMERGING EDUCATION ISSUES*

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*April 3-5, 1989

I *Welcome*

Robert D. Kennedy, Chairman and Chief Executive Officer, Union Carbide Corporation, Danbury, Connecticut

Education is the most important generic issue facing our country and its businesses today. I want to welcome and thank all the participants and guests for helping us with one of the most challenging and important issues of the next 15 years.

Along with other business leaders, I'm concerned that the stage is not properly set for change, especially of the scale that many of us think is required. We in American business are very concerned about the urgent need to replace our dwindling intellectual reserves.

For one thing, American businesses are universally upgrading quality control. This means applying statistical process control in the workplace. As a result, one corporation found it had to retrain all its hourly people and had to include remedial courses in high school level mathematics. Here I'll note that Japanese hourly workers are way ahead of ours in the ability to handle statistical methods.

Change is needed, but first the public must be convinced that the existing condition is unsatisfactory. The American people—who pay the taxes for the education process—think they are already paying too much. Also, they may be a little complacent about the need for change because they see their kids going through high school and at least getting into some kind of college.

It will be hard work to get the American taxpayer to see that our system is inadequate to the challenge of making our society competitive. The ultimate problem of competitiveness is more important even than our budget or trade deficits.

Union Carbide has made significant contributions to education, especially where we have large technical establishments. We especially support programs in those universities that are principal suppliers of new employees. And while we encourage our people to become involved in education at the local level, we haven't actually had a concerted corporate effort so far. The work of our task force—with input from the experts in this conference—will help tell us how we can best direct our financial resources to support education.

We should certainly become more involved as citizens where we work and live. We should make sure we are represented on school boards and participate in local help programs. We *must* do this to insure our future resources of people. And corporate citizens across the nation share these concerns.

The federal government should proclaim that education is a national problem and put forth policy and mission statements. Communities can work out the details themselves. In addition, we need to turn our corporate resources toward an information program that shows taxpayers why they should be concerned about the state of American education.

Even if everyone works together, as they must, it will take the next 15 years to repair the competitive decline of the past 15.

Education Reform: What Is It?

Phillip C. Schlechty, Ph.D., President,
Center for Leadership in School Reform,
Louisville, Kentucky

A lot of folks think that American public education has declined. That isn't the problem. The problem is not that public schools are *worse* than they used to be. They are *better* at doing what they used to do, but that is no longer what we want.

In 1920 only 20 percent of the kids in this country were graduating from high school. Now we've got 70 to 75 percent of the kids graduating, but I will wager that 20 percent of our kids today are getting just as good an education as 20 percent got in 1920.

What we need is more children getting more education. But we are simply not prepared to do that. Our school system has traditionally been based upon the assumption of dropouts as a solution: If the right kids dropped out of school, we could have excellence in education. Test scores would go up.

The situation with American public education is not a matter of absolute deterioration. Rather it is relative deterioration in face of new, greater expectations that started with the democratization of schools after World War II.

As for school reform, it is different from school improvement. "School improvement" means helping schools be better at what they used to do. "School reform" involves inventing ways for schools to do things they have never done.

American public education as we know it was invented in Massachusetts. The purpose of education then was to promote civic morality and literacy. Its intent was essentially political, preparing people to live in this republic.

After the Civil War, industrialization and urbanization began. For the first time, people began to think about the link between education and the economy. American industry did not want schools to provide highly educated people. The factory assembly line was designed on the assumption of basic skills. The American industrial setting did not allow much room for individual decision making or creativity.

The education system considered its high school graduates to be potential management people. As for the school dropouts, there were plenty of jobs for them as laborers. So the schools were set up like factories, designed to select and sort. The curriculum became an assembly line which the kids went down. There was a fast curriculum for fast kids, and a slow one for slow kids.

The teacher became a technician on that assembly line. Teachers couldn't be counted on to be bright, so we had superintendents to make sure that teachers did the right thing. Teachers were given curriculum materials that they could not violate.

In this regard, the "A Nation At Risk" report argues for fine-tuning the old factory system of education. It says we must impose higher standards and not allow kids to graduate unless they meet them. The difficulty is how to get kids to meet the standards. We have never had a school system that could help kids who lack strong parental support to meet those standards. The challenge to American public education is to invent schools that do not depend upon strong parental support.

In the 1920s and 1930s, a progressive "educationalist" movement began in some private schools. It held that schools ought to meet the needs of every child,

whatever the needs and whoever the child. Schools were to be organized very much like hospitals. Teaching was to be a service-delivery profession like medicine or law.

Lots of folks in the present reform movement say that schools should be organized that way. Like their hospital counterparts, teachers would make the professional decisions and administrators would attend to the bureaucratic side.

I'm not sure this approach does the job for children. School is not simply about children. School is the means by which society guarantees its own future. For example, folks talk about the child's right to read. But in our society the child also has an *obligation* to read. A child does not have the right to be ignorant. To be an informed citizen is both a civic and economic obligation.

To make our schools more productive, we must consider what their business ought to be. I believe that education's business is to get children to work with ideas, symbols and beliefs. And as they get bigger, to get better at it, to grow from unskilled knowledge workers to skilled knowledge workers and on to professional knowledge workers.

This means a shift in our thinking. Our schools should not be about selecting and sorting people, not about repairing people who have contracted some inability to learn, and not simply about cultural literacy. Our schools should concentrate on getting kids to work with *knowledge*. Students should be viewed as customers for knowledge.

Instead of merely giving assignments, our task is to invent work from which kids can learn. For example, most kids aren't going to be too fascinated with Hannibal in the Alps. But you can give them a puzzle. Ask them why Hannibal took all those elephants on a long trek through the mountains instead of just getting on a boat and going across a little stretch of water. You can get a lot of seventh graders turned on with a question like that. There are similar examples for other studies like chemistry and mathematics.

If we teach that way, we are changing the role of the teacher. The teacher now becomes an inventor and leader, whose job is to package knowledge in ways that engage youngsters. But if you visit a typical high school now, you will find teachers working and kids sitting there and watching them. We need to reorganize our schools around the work of students, not the work of teachers.

We should start thinking of principals as leaders of leaders—requiring different skills than those needed to leading low-level production line workers. Superintendents should be viewed as chief executive officers.

Too often we don't focus on our customers. If you want to understand why a lot of children don't read, I suggest you go back and try some of the third-grade books. The stories are so boring that—unless you had some adult breathing down your back—you wouldn't read them.

We must reorganize this material so that it has customer appeal, not merely appeal to the academic community. There are ways to get students engaged in understanding knowledge. Just as American business is reinventing itself, American schools must now reinvent themselves.

If this reinvention is to happen, we must be sure that a particular school system has the capabilities to improve. For one thing, there must be a shared vision within the school about its business. Just as Union Carbide must get people all over the world to share the Union Carbide way, school superintendents must do the same.

Schools need quality control to judge the quality of the service they are providing. In education we often get pushed into using accounting measures—like test scores or dropout rates—to judge quality. But these measure the quality of kids, not the quality of service provided.

We need to reconceive what we mean by results. We need to invent schools that promote success. We need to have policy flexibility. We have to learn to lobby our legislators in the interest of education.

We must be articulate in our lobbying to make our schools more effective. For example, much business lobbying in the early 1980s worked towards raising

standards by imposing more regulations. That created more bureaucracy to try to manage something that was already unmanageable, rather than creating a different management system.

One of the reasons schools are so hard to improve is that they do not have developmental capital. We need to invent some way to make long-term capital available to schools. It is difficult to maintain developmental capital for developmental purposes. Immediate needs often absorb it.

We need to have a commitment to continuity. Too often we forget to maintain the projects we start. For example, in one Kentucky school we trained teams of elementary teachers to handle computer courses. Then we dropped the training. A few years later, the original teams had dwindled by transfer and attrition. Most of the computers were sitting in classrooms without being used because there weren't enough trained teachers left.

Until you know what your purpose is, you don't know what your vision is. And if you don't know what your vision is, you don't know what kind of structures you need. The first move in the issue of restructuring is for business and education leaders to sit down together and agree upon the purpose of education.

If such a partnership between business and education is to be effective, these leaders must not talk past each other. They must develop both a common language and a common vision.

Education Reform: Will It Work?

John E. Chubb, Ph.D., Senior Fellow,
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Educational choice is probably the best idea for improving America's schools. If you think about what's been going on in American education for the last 20 years, you have to realize that perhaps something significantly different needs to be done.

The year of 1989 is not the first time we've experienced education reform. Reform has been taking place as long as we've had schools. It is a constant process. We've been trying to improve our schools for the last 25 years.

Has it made a difference? Despite all the past efforts to improve our schools, they really don't perform very well.

One of the concerns about choice is that it would create a set of education systems where the have's would prosper and the have-not's would suffer. But that is exactly what we have now and it has nothing to do with choice.

Out in the suburbs there are some wonderful schools. But in our cities, by and large we have miserable schools. Schools where people are trapped; where education has not improved despite 20 years of effort to turn it around. Dropout rates in large cities like Washington, D.C. are close to 50 percent. Nationwide the dropout rate is 25 percent and not improving.

All kinds of improvement efforts have going on around the country. Some of them have helped. Many have not. One thing we've done is spend a lot more money. Since 1970 we've increased per-pupil school expenditures nationwide by more than 400 percent (without taking inflation into account). Pupil-to-teacher ratios are down by 40 percent. Over the last five years, no occupational group in the country has enjoyed larger salary increases than teachers. In other words, we've been doing many of the things that educators have long recommended.

We're stuck, though, with a system in which many students are fairly well educated, but others are very poorly educated. Progress is hard to see. Yet we're told that we shouldn't consider anything as radical as restructuring America's schools. Educational experts are saying, "Let us handle it. Good things are going on at the community level. Don't interfere with us." But that's exactly what we've been hearing for the last 20 years.

I'm not in favor of mandates from governors and legislatures telling educators what to do. But on the other hand, we do have to be cautious about accepting the promises of our education system that they will do better, if they only had more money or more staff.

My belief in education choice grows out of a study we conducted of 500 public and private high schools nationwide. It involved over 10,000 students and 10,000 teachers, principals and administrators. We looked for answers to this simple question: What do effective schools *look like*?

We studied effectiveness in terms of student achievement. The high school students in this study were given tests in reading, writing, vocabulary, mathematics and science when they were sophomores, and again when they graduated. That let us measure achievement gains. This methodology gave inner city schools the chance to emerge from our study

as successful schools if they promoted gains in their students. By the same token, if a fancy suburban high school with high SAT scores didn't show their kids gaining, we didn't regard it as an effective school.

What turns out to be the most important factor in student achievement? The depressing news is that it is the aptitude of the student. The brighter a kid is, the more likely he is to learn during the high school years.

But the second most important determinant is the school itself. Schools *can* make a difference, which is good news for school reformers. According to our data, if you put a child from a poor background into a proper school, you'll see a difference.

Now, what is it about some schools that makes them much more effective than others? Several things turn out to be unrelated to student achievement gains: Expenditures per pupil, teachers' salaries, class size, graduation requirements and amount of homework assigned. Yes, graduation requirements and the amount of homework assigned are not related at all!

According to our study, effective schools were well managed and organized. They gave high priority to academic excellence. By contrast, ineffective schools gave priority to such things as occupational skills, good work habits, citizenship and other such basics.

Effective schools showed a clarity of purpose. The teachers knew what they were trying to accomplish. Principals in these schools said they wanted to lead. In the ineffective schools, principals said they liked the position because they preferred administration to teaching. Administration may be necessary to make a school run smoothly, but it doesn't focus on educational goals and instructional leadership.

In the effective schools, teachers are trusted to make their own judgments. Teachers are involved in school decision making. They cooperate with one another. In the ineffective schools, morale is low and teachers don't cooperate.

Successful schools look a lot like successful corporations, where people work in teams. Unsuccessful schools look a lot like a department of motor vehicles, where everyone is a bureaucrat, working according to rules and regulations.

The main organizational difference between effective and ineffective schools is their degree of autonomy. The freer a school is from external control—by administrators, unions and school boards—the more likely it is to be effective. The more control the principals and teachers have over curriculum, instruction, discipline, and—most important—hiring and firing, the more likely they are to develop into a coherent, effective teaching team.

Teaching is more an art than a science and is very difficult to successfully regulate. Our study showed that the more you regulate teaching, the more you mess it up. *Autonomy* seems to be the key to an effective school.

Unfortunately, the nation's problem schools are in the inner cities. When school performance deteriorates, these schools are not given autonomy, nor the support they need to develop effective organizations. Instead, they are regulated even more by politicians and administrators.

However, private schools have figured out on their own how to be effective. Competition makes the difference. Their primary concern is pleasing parents—if you don't please them, you're out of business.

Unlike public schools, private schools avoid large bureaucracies. New York City provides an excellent illustration of the difference. The central office of the Catholic school system has 25 employees. Serving only about five times as many kids, the public school system has a staggering 6,000 employees in its central office.

Unfortunately, the history of school reform in this country has been to take authority out of the schools. As a result, schools perform poorly. Further reform of

that sort will not turn our schools around. More regulation is not the answer. Autonomy is.

We must move to a system that relies more on competition and choice and that holds schools accountable for their results. Schools should get their resources based on their ability to please parents. This will provide an incentive to organize more effectively.

There are many ways this can be done. Vouchers, open enrollment, controlled choice and magnet schoc are some. My purpose is not to argue for any particular method. Rather, it is to point out that we have to restructure our schools to be more competitive if we are to achieve significant and lasting change in the quality of American education.

Parental Choice of Schools: Catalyst for Change?

Lewis W. Finch, Ph.D., Superintendent of Schools,
Anoka-Hennepin Independent School District,
Coon Rapids, Minnesota

I've heard the arguments that parents should be able to choose the schools their children will attend. I have seen the Minnesota choice plan espoused as the model for the nation. But for those of you who believe that choice is going to be the panacea that will rescue American public education, you had better think twice. And if you think Minnesota is the model to emulate, I would caution you. All is not well in Camelot. You should take a look at what is *really* happening in Minnesota.

Effective reform will not come through the Minnesota open enrollment plan. There is not enough strong evidence to indicate—one way or the other—whether the plan is successful or not. Minnesota doesn't really have full-scale choice yet. It won't start until next year. Up to now choice has been voluntary, and not enough people have been volunteering for it. This disgusted the politicians and others who had been advocating it. As a result, they held school funding hostage until they received mandatory open enrollment.

Claims about higher test scores and lower dropout rates are based on fewer than 500 students, the total that have participated in choice so far in Minnesota.

The only thing new about Minnesota's open enrollment plan is that it permits parents to send their children to schools in districts other than where they live. It's not a matter of having choice within the district—we've always had that.

The reasons parents choose a particular school has been illuminating. They don't choose on the basis of the quality of the education programs. They are more likely to choose a school that's close to the babysitter or the day care center. Now that's a very real need for these parents. If you want to be successful in marketing an elementary school to parents, establish a day care center in it. However, that won't improve the quality of education in the school.

One high school decided to raise its graduation standards. As a result, a number of its students transferred to a neighboring high school that had lower standards.

Another Minnesota high school began receiving many telephone calls from parents who wanted their children to attend it. Why? Because the school had a good hockey team. The quality of the hockey team may be important to some parents, but it's not going to result in improvement in the quality of their children's education.

A school district in northern Minnesota consolidated two senior high schools into one to save money. The parents of the students whose school was closed became so angry they enrolled their children in a neighboring school. Their motives had nothing to do with the quality of education. Kids simply became pawns in a political war.

If you allow parents to indiscriminately opt out of a school district, you risk bankrupting the district financially and educationally. If the Minnesota open enrollment plan spreads, there will be islands of educational excellence surrounded by vast educational wastelands.

America will be divided into areas of have's and have-not's.

Parental Choice of Schools: Catalyst for Change?

Seymour Fliegel, Former Deputy Superintendent
Community School District 4,
East Harlem, New York, New York

Parental choice is an effective mechanism for school improvement. But choice is not an end unto itself. A choice system must offer both quality and diversity or it won't be successful.

What makes for a quality school? The school must know its mission. Its staff must know where they are going.

Teaching and learning have to be the focus, which is not the case in many schools. The two are intertwined. A teacher can't use the excuse, "I taught that to the children but they didn't learn it." That's like saying you taught your son how to swim, but every time he gets into the pool he sinks to the bottom. You haven't *taught* something until someone learns it.

Comprehensive high schools offer a wide variety of courses, but 95 percent of students choose the same ones. Kids get lost in these large schools. Smaller schools are better for them. In a small school they feel that everybody knows who they are. Each kid feels important.

Expectations are crucial. How you treat people determines how they behave. If you have high expectations for youngsters, teachers and principals, they will not disappoint you. Nor will they disappoint you if you have low expectations.

Choice is one way of giving a sense of ownership. The youngster selects your school, the parent selects it and the teacher selects it. That sense of ownership is an old capitalistic idea. People treat what they own better than what they don't. For example, in almost all our district's schools, there is an absence of vandalism. The kids' work is displayed on bulletin boards all year long, and nothing happens to it.

Diversity is also an important aspect of choice. Not every youngster learns the same way. Not every teacher has the same strengths. Diversity tells youngsters, parents and teachers that we are trying to meet their individual interests. Diversity is why kids in our schools say, "This is *my* school," even though there are 52 schools and 20 buildings in the district. Each school has its own identity.

We encourage youngsters and parents to make their choice on an informed basis. In the sixth grade, youngsters are trained in how to make decisions. Then we conduct a series of open meetings where parents can learn more about specific schools. We give out a booklet describing each school. Every parent gets ratings on the schools that include reading scores. Then we invite parents and kids to spend a day at the schools that interest them most.

The kids get three choices of the schools they want to attend. Ninety percent of them get one of those three.

One complaint I've heard in the education community is that children and their parents—especially poor ones—are not qualified to make good choices. That has not been our experience in East Harlem.

You don't have to be a genius to figure out which schools are the good ones, or which teachers. Ask any parent which school is best. Ask any kid who the best teacher is. They'll tell you.

Parental Choice of Schools: Catalyst for Change?

Charles W. Fowler, Ph.D.,
Superintendent of Schools,
Sarasota, Florida

Reform is alive and well. It is taking place in school districts across America. We often focus on worst-case scenarios and overlook some very exciting things happening in the school systems.

In Sarasota County, Florida, for example, we operate under a comprehensive plan that involves not only the staff, but also the parents and local business and professional communities. Each school and department within the system has a strategic plan for improvement. It reflects the unique needs of a school's clientele or a department's staff.

We have also reached an agreement with our union that lets us resolve conflicts between union contracts and school board policies in an individual school. Instead of trying to decide what's right for 27,000 kids, we're able to concentrate on what's right for 400. Instead of a seniority approach for filling vacancies, we have a personnel committee at each school site made up of staff and parents. They determine the qualifications needed for a teaching position and interview and screen candidates. Based on that, I make recommendations to the school board.

Staff training is pervasive. We spend a great deal of money in training administrators, teachers, aides—and yes, parents. We recognize that training and retraining has to be a constant process.

These are the kinds of thoughtful reform that we believe need to be carried out before choice of school can work. And choice does work, because of *investment in ownership* by the parent and the student.

When one shares in the "ownership" of a choice, a psychosocial principle seems to come into play that contributes to the success of the enterprise. Commitment is more important than the level of skill. For this reason, a student who has chosen a particular educational program may be more successful in meeting its goals.

Merely applying free enterprise to schools, however, does not necessarily make choice work. Chicago, for example, has one of the finest parochial school systems in America, measured by student achievement. Because these schools offer generous scholarships, essentially kids in Chicago are able to attend a school of their choice.

Has the presence of this competitive system raised the quality of the Chicago *public* school system? According to former Education Secretary Bennett, Chicago public schools last year were the worst in the nation. This shows that the mere presence of competition alone doesn't guarantee that choice will work. The Illinois Governor and legislature have apparently recognized this and have just restructured the public school system to incorporate greater parent involvement.

In a similar example, many parents in the United Kingdom place their children in that country's "public" (actually private) schools. Has the presence of this competition strengthened the government schools? Not according to the evidence, in which students of these schools consistently show low achievement scores.

By comparison, the concept of competing schools is virtually unknown in Japan and Russia, yet records of student achievement are consistently high in these countries.

The impact of these facts is that choice *within* public education can offer at least as much potential as choice *between* public and private education. And there are several methods by which effective choice can be realized.

Alternative schools provide a choice for students whose needs aren't met by mainstream schools or programs. For example, many students feel lost in large high schools with enrollments of as high as 3,000. These students and their parents are willing to trade broad program offerings for a more personal school experience.

Magnet schools go a step further by creating alternative programs to attract non-minority students to enroll in schools which are attended largely by minority students. Magnet schools might specialize in art, music, drama, math, science, computers or foreign-language immersion courses.

Handicapped and gifted students have exceptional natures in common. Neither group may achieve their potential in ordinary school settings. Those who are minimally handicapped can take a mixture of both regular and special classes. Illinois and North Carolina have recently constructed boarding schools for gifted and talented children. Such choices require specific entrance requirements.

Vocational schools allow students to complete basic academic requirements and also learn skills for careers in such areas in industry, public service, marketing and agriculture.

Open enrollment gives parents and students the chance to freely choose among neighborhood schools within a particular district. In some cases, a parent must certify that a different school is necessary to be near after-school child care. Another variation restricts choice to a limited number of schools within a district.

District-to-district choices are offered in some states. These are usually confined to special program offerings. They usually require the approval of both the sending and receiving districts but still contribute to the concept of choice.

My own experience with open enrollment began in Illinois in the early 1970s. The plan became necessary to satisfy parents after the replacement of old schools by new ones and a resultant change in district boundaries. At the time, many believed that open enrollment would empty out the less effective schools. But that didn't happen. Most schools gained as many students as they lost.

This unexpected result indicates that parents and students are motivated by a variety of factors in exercising school choice. Proximity to child care was at least one such factor.

Was there any noticeable impact of parental choice on student achievement results? None that we could see, but circumstances made it impossible to measure this definitively.

In one Florida magnet school—Sarasota's Bay Haven School of Basics Plus—differences in achievement *were* measurable. This school began a magnet program to attract whites into what had been a predominantly black school. Fundamental skills and strict discipline are emphasized. Parents must contribute their time to the school, and PTA attendance is mandatory. The school has been immensely successful, with higher-than-expected achievement results. Yet the school's curriculum and discipline are about the same as in other schools. Choice and commitment seem to be the overriding factors in higher achievement.

What might Union Carbide's role be in addressing the parental choice issue? One possibility is to fund a comprehensive analysis of the impact of choice programs upon student achievement. A second would be to fund staff training programs designed to customize teaching and learning to the needs and abilities of particular groups of students. Some children learn best visually, others orally, and some interact well with computers, for example. Teachers must be trained to be comfortable with these different approaches. Finally, programs could be established to help inner city parents become more aware of the choices available for their children's education.

The shortcomings of American education could also be alleviated by going to a longer school year.

Japanese children, for example, attend school for a minimum of 240 days per year. Ours, just 180 days. Japanese high school graduates have the equivalent of four more years of schooling than their American counterparts.

This American practice dates back to an agrarian time when children were needed on the farm to help plant and harvest crops. Unfortunately, the long vacation causes children to lose learning skills, which then must be reacquired. Increasing the length of the school year would provide teachers larger salaries in exchange for increased student productivity. Increased time in the school environment would also counteract the trend away from parental supervision in many American homes.

Most so-called school reform that has taken place in American schools in the last 10 years has been largely driven by legislators and governors. Such reform is diametrically opposed to choice. Its premise is that there is a single best way to do things.

Schools and communities themselves should develop these choices. It shouldn't be done by mandate, because mandate does not work.

Winning the Brain Race

Denis P. Doyle, Senior Research Fellow,
Hudson Institute,
Indianapolis, Indiana

A question we face is what our public school system should do to help meet the competitive challenges to our nation. In responding, I have no choice but to compare ourselves to our most successful trading partner, Japan.

The Japanese have delivered on the promise of mass education, where we have failed. Ninety-six percent of their youngsters graduate from high school with an education equivalent in most respects to a four-year college degree in this country. The Japanese systematically outscore us and the rest of the world in almost every measure of intellectual and academic achievement.

The Japanese care about education and use it to bring about social and economic change. They believe deeply that effort counts. In a recent study, when American parents were asked what accounts for academic achievement, they overwhelmingly answered, "ability." Japanese parents answered, "effort." That accounts for the extraordinary differences in measured achievement in the difficult studies of science and mathematics. Americans say they have no aptitude for it and can't do it. By contrast, Japanese respond by redoubling their efforts.

It would be a terrible mistake to try to imitate Japanese schools in every respect—save performance. Our country's strengths lie in diversity, innovation, entrepreneurship and independence. These are paralleled by the strengths of our higher education system. Our best universities—both public and private—are without peer in the world. So we have the ingredients to make our primary and secondary schools of similar high quality.

What kind of schools do we need for the rest of this century—and the next? We do not need vocational education, which limits youngsters to accidents of birth and conditions of circumstance. Rather, we need a liberal arts curriculum which is both broad and deep. It should teach history, the great documents of citizenship and literature, prose and poetry, second languages, hard sciences and mathematics. These offer ideas to prepare men and women for leading lives of ordered liberty.

A liberal education imparts the skills needed in a mature, post-industrial service economy. Students acquire skills in communications, computation and analysis. Indeed, such skills are now needed on the factory floor, where workers must be able to read complex documents, from blueprints to OSHA reports.

Most important in our modern economy is the capacity to continue learning throughout life. Persons entering the workforce today may expect to have five to seven different jobs over their working lifetime. In some cases these will be with the same corporation but will require different skills.

As we look to the future, it is essential to understand more about the process of education in this country. This is particularly true since no two groups in America know less about each other than business leaders and educators.

Most American schools are organized around seat time, or other factors that can be measured by clock or calendar counts. California has a particularly restrictive education code. It tells teachers and principals precisely how many minutes of instruction must

be offered in given subjects. Interestingly, California spends more money on driver education in high schools than it does on remedial reading. While it may be more important to drive than to read in California, the emphasis is wrong headed.

Schools should take a major page from the book of business: They should concentrate on the factors that ought to be measured. They should establish performance standards, measure them, and see that they are met. That way, when a youngster earned a diploma, it would mean something.

A school's visible curriculum addresses the knowledge that people need to work and succeed. There is also an invisible curriculum that is equally important to success. It consists of punctuality, neatness, decorum, dress and behavior. These make the difference between being employed and unemployed for many youngsters, especially in our post-industrial service society, which is highly social and interactive.

Autonomy, independence and professionalism in our schools is essential for the long-term vitality of the American education enterprise. This means that schools would be subjected to risk of institutional failure and subsequent closing. As a people we have no obligation of any kind to social institutions that cannot meet their responsibilities to children. They should face a market test: Change or fail.

North Carolina has created a special school—the School of Science and Mathematics—in such a way that it cannot be controlled by bureaucrats. The school need not hire credentialed teachers, nor use state-mandated textbooks. After just eight years of operation, it is now among the top *three* producers of merit scholars in the nation. Moreover, it is racially, economically and socially integrated. Partly because it is a boarding school drawing upon students from the entire state, it costs more to operate. But the people of North Carolina are willing to pay for it because it delivers the goods.

Autonomy is essential if American education is to become vital. And American business can help, because it knows about setting goals and objectives, about performance standards, about hiring and firing, about performance measurement and about resource allocation. Business has much to offer education.

Impact of Social Issues on Education

Diane S. Ravitch, Ph.D., Adjunct Professor of History and Education, Teachers College, Columbia University, New York, New York

The future of this country depends on the health, education and welfare of our children. These children represent the future of our country, as citizens, workers, consumers and parents. The business community cannot prosper unless they do.

Speaking of business, education itself is a big business. Collectively, our country spends over $300 billion per year on all modes of education. That's a lot of money to be spending in a way we're not very pleased with. Interestingly, one out of four Americans is involved in education either as students or school personnel. But this massive business is not being run as intelligently as a business should be.

As a country, we are falling behind our competitors in the global marketplace. Education has a lot to do with that. Other countries have more demanding curricula, longer school years, more dedicated parents and a more ambitious and disciplined core of students.

The great strength of our economy is that we have allowed educated people to take off and do exciting things. Educated people are also among the least prejudiced, an important factor for social harmony.

Education by its very nature cultivates the behaviors and values that make democracy possible. Education teaches us to use persuasion instead of force, to rely on ballots instead of bullets for political change.

Education is a matter of national concern because we are only now coming out of many years of neglect and decline. The situation began to turn around in 1975, when the dramatic fall in SAT scores was publicized. After this revelation, a blue ribbon commission was set up by the sponsors of the SAT to examine the causes of the decline.

A number of reasons came out. Kids were advanced from grade to grade despite not being able to read, write or compute. Absenteeism was high. Fluffy electives had taken the place of basic courses.

In 1979 there was another study. This time by a presidential commission on foreign languages. This study pointed out that foreign language instruction was at the lowest in our history. Only 15 percent of high school students were taking a foreign language course. In other countries, however, nearly all students were studying foreign languages.

Again, in 1980, there was still another report, this one by the National Science Foundation. It called attention to low enrollments in math and science, particularly the advanced courses. Achievement levels had also declined. It raised the frightening point that the public was largely ignorant of science, at a time when public policy decisions were starting to revolve around technology.

In 1983, the "A Nation at Risk" report recommended adherence to the "new basics." All students were to study four years of English, three of math, three of science, three of social studies, two of a foreign language and a half year of computers.

When the Department of Education attempted to correlate those standards with actual high school graduation transcripts, they found that only 2 percent of the graduates actually met the standards.

Later, in 1984, a study compared the learning of math in different cultures: Japan, Taiwan and the U.S. Kids were followed from the first grade through the fifth.

The kids started off equally in the first grade. But by the fifth, the worst classes in Japan were ahead of our best. Ironically, when parents were asked how they felt about the quality of their children's education, the American parents were the most satisfied.

The study observed that American kids spend a lot less time learning than children in Japan or Taiwan. Twenty percent of the time no one even knew where the American children were. There was no such category in Japan or Taiwan; everyone knew where the children were.

Just last year, an international study compared science knowledge among students in 17 countries. Our fifth graders ranked eighth. Our ninth graders placed 16th. Our twelfth graders came out at rock bottom—17th—even though they were all enrolled in biology, chemistry and physics.

This year, the National Assessment of Educational Progress released the results of a six-nation survey of 13-year-olds in Canada, Ireland, Korea, Spain, the U.S. and the U.K. We placed dead last in math and in science we were well below the mean. Ironically, when our kids—the worst—were asked if they were good in math, two-thirds answered, "yes." This confirms the realization that American children and their parents have unrealistic and inflated notions of their accomplishments.

School practices have contributed to this long slide in achievement, especially the changes brought about in the 1960s and 1970s as a result of college protests and demonstrations. We lack a clear sense of purpose, which is communicated through low expectations, unstructured learning environments, poorly conceived curricula and poorly written textbooks. Teachers are often assigned to subjects for which they are not prepared.

The emerging economy of the next century will demand far higher educational performance. We must overcome the obstacles to good education. Otherwise, we will see our standard of living decline relative to that of countries which have a well-educated, highly motivated and highly productive workforce.

The single most destructive influence on our schools in the past generation has been the deterioration of family support for education. The rapid increase in single-parent families, caused either by divorce or birth to unwed mothers, has produced vast numbers of children who live in homes of very limited means. Unwed teenagers who have children are ill equipped for parenthood. They are seldom able to give their children the care or social skills they need to succeed in school.

Many of these children have been subject to years of neglect in terms of nutrition and health care. Sometimes they have also been physically abused. Their teachers are asked to be not just teachers, but also psychologists and social workers, an impossible situation.

Even in families with greater financial means, it is unlikely that we will ever again have large numbers of women staying at home with their children. As a result, many children today return to an empty home. Many lack adequate supervision, and never have the daily support and encouragement of their parents in doing their school work. The parents don't have time to go to school meetings and can't take their children on trips to museums, zoos or libraries. This means that teachers are often all alone in struggling to educate these children.

Children need caring adults around them. They need approval and praise when they work hard. If adults are not there, children will learn behavior from television or their peers. The kind of behavior that wins approval from their peers is usually the kind that gets them into trouble in school. They are more likely to learn about using drugs. Since they also tend to learn about sex from their peers, they are more likely to contribute to the problem of teenage pregnancy.

Our teen culture is shaped largely by mass entertainment media. Movies, television, videos and rock music glorify drugs, promiscuity, violence, flashy clothes and expensive cars. In such a world of artificial values, the student who studies hard, reads books, and stays after school to do a science experiment is not considered a hero, but rather a nerd.

Adults must actively intervene to promote strong social and educational values in their children. They must let children know that education is important and that hard work and self-discipline are prerequisites to future success in any field.

Corporations can help by providing day care centers in the workplace. We might also consider establishing schools and after-school centers that are convenient to the workplace. It is another way that kids and parents can be brought closer together.

The Impact of Social Issues on Education

Robert L. Woodson, President,
National Center for Neighborhood Enterprise,
Washington, D.C.

If we are to be competitive as a nation, we must find strategies to meet the needs of the poor. Eighty percent of new entrants to our future workforce will be black and Hispanic. In matters of national defense, most of our ground forces will be drawn from these same groups. If we do nothing, we may be faced with the prospect of importing skilled labor. This, in turn, would only exacerbate the problems of the poor.

Poor people have been unfortunate pawns in a struggle between the political right and left as to how to best meet their needs. People to the right of center believe all you need is to open the gates to the free enterprise system. They fail to understand that if the poor are to compete successfully, they need information that many do not have.

People on the left believe that, even if the poor have the requisite information, they are still too stupid to make informed decisions for themselves. They would need professional service providers acting on their behalf. Liberals also tend to believe that, if we increase expenditures in traditional programs, problems will somehow go away.

The issue isn't whether we spend more as proof of our compassion as a nation. Rather, the issue is how to invest precious resources more wisely.

As a nation, we've spent one trillion dollars in the last 25 years on programs to aid the poor. At the beginning of that period, 70 percent went directly to the poor as cash transfers. Only 30 percent was for administration and services. Now that's reversed. Seventy percent goes to administration and services, only 30 percent directly to the poor.

Looking at it another way, the poor represent a $240 billion industry for those who serve them. But these servers are not held accountable for results. Whether or not dependency is reduced, or children learn, budgets continue to soar. The servers respond to their sources of funding, not to the concerns of their customers.

There is an outpouring of what social scientists call "needs-assessment" studies of low-income communities. These studies list the number of people on drugs, the number in prison, the dropout rate and other similar descriptions of failures. Solutions are not offered.

If you want to learn how to be successful, you must study success, not failure. At the National Center for Neighborhood Enterprise, we want to know why 50 percent of children living in low-income, drug-infested communities are *not* on drugs; why young girls are *not* pregnant, *not* in prison, despite being exposed to the same conditions as their neighbors.

At the National Center, we go into communities and participate in forums for people who have been successful in reducing teen pregnancy, reducing gang violence, driving out drug pushers and motivating kids to stay in school.

Regarding education in particular, we've learned that at least 420 independent neighborhood schools have been established in this country by low-income parents and disaffected public school teachers. Most of them operate on 60 percent of a comparable public school's budget. Despite the fact that some of their students were thrown out of public schools, many are graduating two years above level.

Parents select these schools because they *teach*. The schools instill the difference between right and wrong. They give awards not only for academic achievement, but also for the kids who performed the greatest act of kindness, overcame the greatest difficulty or made the greatest sacrifice.

Groups have also been formed in many low-income communities to help students do a better job of learning in *public* schools. One such group, called "College Here We Come," operates out of a public housing project in Washington, D.C. It's headed by a woman who—despite being abandoned at the age of 19 by her husband—got off welfare in three years, raised five children successfully in public housing, and sent all five to college. PTA meetings, for "College Here We Come" students and their parents, are held one month in the public school; one month in the project.

In the ten years prior to this program, only two kids from the project went on to college. In the eight years since "College Here We Come" has been functioning, 600 have. Teen pregnancy went down by half during the same period. Welfare dependency is also down. Ironically, most states—which confuse certification with qualification—would prohibit the founder from practicing in a conventional school because she doesn't have a master's degree in early child education.

We should be interested in people who *perform*. Yet by insisting on certification, we prevent qualified people from sharing their abilities with others. In particular, we tend to dismiss contributions from low-income people if they happen to lack certification. The result: We are missing a key ingredient for innovation.

Everything that low-income kids see around them is oriented towards consumption of resources, rather than the creation of wealth. There is no equivalent of Future Farmers of America or Junior Achievers in their schools. But in one inner city Washington school, there's a sixth-grade stock class, where the kids trade in the market. They're learning the skills associated with creating income and wealth. Neighborhood groups have helped other kids form companies to manufacture products—like wooden pallets—needed by local industries.

There are many other ways young people can fill unique gaps in the marketplace. While they are learning the discipline of running a business, they are also getting motivated to stay in school.

Today, it seems that only free-market experience some low-income communities know is the local drug dealer. Some neighborhood groups have intervened in the drug trade in a very interesting way. In one case, they went to the kids who were employed as carriers by the drug dealers. They showed the kids how they could make money doing things like producing chocolate chip cookies and selling them in a ball park in Washington. Now the kids are getting acclaim from their communities and in many cases local drug dealers around the country are being pushed out by this kind of effort.

Making Change Happen

Arthur E. Wise, Ph.D., Director,
Center for the Study of the Teaching Profession,
the RAND Corporation, Washington, D.C.

I applaud the concept of Union Carbide taking the time to figure out what it wants to accomplish in the field of public education. Too many corporations plunge ahead before they really understand the nature of it.

American public education is a very complex enterprise and is very difficult to change. Unless you poke the system in the right place, it will go unnoticed. Or perhaps schools will seem to be responding to your poke, but in fact are not.

If you want to influence the system in a substantive way, you must confront a mass of agents and agencies who shape education policy. At the local government level the main actors are the school board, the school superintendent and the central administration of a school district. This separate governing structure was created to remove education from partisan politics. However, the city council and the mayor still have influence, especially in budgetary matters.

This local complexity—which also includes the courts—is largely duplicated at the state level. In some states, the commissioner and board of education are elected, and in other cases appointed. The state education departments are generally composed of career bureaucrats. In a given state, these three forces may be pulling in the same direction, or not. At the same time, state legislatures and governors may be pulling in still different directions, concerned with the monies they budget for education.

Much the same is true at the federal level, which consists of the President, Congress, the Department of Education, federal courts and many other agencies.

Some of the most important and lasting changes have been made by the courts. The Supreme Court initiated desegregation of public schools. At the state level, courts have forced greater equalization of school support.

Many non-governmental national associations also influence education policy. Among others, these include the American Federation of Teachers, the National Education Association, the National School Boards Association, the National Association of State Boards of Education and the Council of Chief State School Officers.

Publishing firms also determine what children will read in school. Testing firms, such as the Educational Testing Service, exert profound influence by creating college-entrance examinations and other widely used standardized tests.

Other influences include chambers of commerce, voter organizations, taxpayer leagues, groups like the NAACP and PTAs. Many agencies seek to shape educational policy; thus there are many places to enter the policy-shaping system. There are several different methods of accountability operating in the education system. In cases where school boards and others are elected, if we don't like the results, we can throw them out (democratic accountability). Other officials are appointed. With them we have only indirect accountability, perhaps through a governor (political accountability). There is also legal accountability: Schools must be operated according to the constitution and relevant laws.

Bureaucratic accountability operates within schools. How does it work? A set of rules, regulations and

procedures are enunciated and must be followed. These may come from federal, state or local levels. This type of accountability is somewhat out of favor now, as some suggest that a market mechanism would result in better school performance (market accountability).

There is also a system of professional accountability, directed at the performance of teachers and administrators. All in all, there is no universal agreement as to which accountability methods are best—the result is that all systems are in use, sometimes working at cross purposes, sometimes cancelling each other out. Professional accountability—in particular—needs to be strengthened and teacher licensing is the key to doing so.

Teacher licensing is in a deplorable state. Youngsters should be guaranteed teachers who know what they are doing. We must reform teacher licensing so that we send to our schools only people who are well equipped to carry out their responsibilities as teachers. Presently, the hodgepodge of certification and alternate certification (actually anti-certification) laws does not provide the quality control school children so desperately need. Over the next 15 years we will have to replace most of our teachers. By reforming our schools of education now, we can take advantage of a strategic opportunity to change the way in which the next generation of teachers is prepared and licensed.

First, every teacher should graduate from a liberal arts college before they prepare to become teachers. Then they should have a one year master's program in teaching and learning.

I would not end it there. There should be a year-long internship for teachers in a professional development school—somewhat like a teaching hospital.

Nothing could be more foolish than what we do now. We take 21-year-old kids out of a college of education and place them in the most demanding teaching assignments that we have, in the inner city. Then we are surprised that the attrition rate of new teachers is as high as 50 percent.

As noted, we also need to reform our teacher licensing system. The public should be assured that teachers are in fact qualified to teach.

We need to reform our school administrative procedures. Many of these procedures exist because we have a teaching force of uneven quality. If we have well-prepared teachers, we won't need the kind of administrative superstructures we now have.

Our teachers organizations—the AFT and the NEA—need to continue the reform they have already started. In fact, these organizations are way out in front in advancing novel ideas for improving education practices.

Our student testing procedures should also change. They should accurately measure the performance we expect students to be able to exhibit. If you want to know how well a student can write a paragraph, you do not give a multiple choice test which asks the student to find the main idea in a paragraph. You ask the student to write a paragraph.

To improve this situation, we need more research and development money for education. Now there is virtually none. We need more sophisticated examinations—which are expensive to develop and to administer.

Professional accountability also depends upon a rational system of compensation. First, it must be high enough to attract young people to become teachers. Right now, the number of young people entering the teaching field is inadequate to the increasing demand. The imbalance will grow unless we improve compensation and working conditions.

As for tying compensation to performance, no way has yet been found that works. When you send your child to school, you want the best teacher, and so does everybody else. The education system cannot long sustain a situation in which 10 percent of the teachers are cited as superior and 90 percent are designated as inferior.

How do we redesign the system? One way is for a community as a whole—including parents and businesses—to band together. This has produced good results in some places. You can also support research or lobby for the federal government to do so. You can support demonstration programs and reform of education colleges.

There is perhaps no better way to entice young people into teaching than to award scholarships. There are very few being awarded at this time.

As a corporation, Union Carbide could either work alone or form coalitions with educational, advocacy and research organizations and local schools, districts and schools of education.

There are many goals to choose from. Your purpose might be to improve education generally. Or perhaps to improve the fit between school output and the input that businesses need.

Your goal might also be to update the management methods used by our schools, a task for which—as a successful business—you are especially qualified. The schools of today are organized according to the management principles of 1900. In the meantime, however, corporate management techniques have changed dramatically. Among other changes there has been restructuring and downsizing. There has been more collaboration between labor and management. Services are often bought from outside vendors. Sophisticated management information systems have been developed. Importantly, the orientation of most businesses is now toward the customer, not merely pushing products off the assembly line. These are methods of management which could transform public education in the 21st Century.

Business and Education

Jackie Ducote, Executive Vice President,
Louisiana Association of Business and Industry,
Baton Rouge, Louisiana

Clearly we must change education in this country, but can we?

No, not unless business leaders dare to be risk takers and help change the very rules by which we can make change happen. Otherwise, our efforts will simply continue to get tangled up in the web of politics or become lost in the bureaucratic maze that envelops every level of the public education system.

My entry into the trenches of education reform began 15 years ago. My two sons attended an inner city elementary school in Baton Rouge. There were problems at the school, but I believed that—in our democratic society—parents had power and could bring about change. I had no patience with parents who deserted the system to send their children to private schools.

My next 10 years were spent searching for education reform, working first as an activist with parents groups and then as chief education spokesperson for the business community. One businessman warned me early on that the public education system could not be improved from within; would not accept change so long as the bureaucracy could resist it and would have to reach the brink of disaster before the bureaucracy could be overthrown.

In addition, a state representative tried unsuccessfully to get me to rethink my definition of public education. He said public education should mean just that: Education of the public. It should not simply be a synonym for government-operated schools that are in fact failing to educate the public.

Unfortunately, I did not appreciate the wisdom of these two men until years later.

Beginning in the late 1970s the Louisiana business community got involved in education reform—long before it was the fashionable thing to do. We intervened at all levels of the education system. We undertook research studies, set goals and developed an action plan which involved both legislative and non-legislative programs.

We made education an election issue and also created an organization called APPLE—Advocates for Public Participation in Louisiana Education—to inform the public of decisions that were affecting their children. In addition, we encouraged local businesses to become more directly involved through "adopt-a-school" and other programs.

We helped get more than 50 laws passed and programs implemented. But the bottom line is that—despite the many reforms—quality indicators in our state are still down. We still have the nation's highest illiteracy rate. Our students rank 27 out of 28 among the states which use the American College Test. Forty percent of ninth graders don't graduate from high school. Fifty percent of college freshman have to take remedial classes.

Our ten-year search for education reform has been a long journey to nowhere. Most of the new laws and policies have been watered down, ignored, not implemented properly, taken to court by teachers unions or mired down in political turf battles. Often programs were not funded properly because that was an easy way to kill them.

The Louisiana pattern has been repeated in state after state and another generation of children has been lost in the process.

Piecemeal attempts to change the present system haven't worked and won't work. The education system is a monopoly without incentive for change. It has a captive clientele and is funded regardless of results.

Our only hope is to put an external force (competition) to work that is free from the control of those who have been in charge of our failed education system in the past. We must rethink our definition of public education and empower parents to choose the *best* school for their child, not merely the best school the government has to offer. (While choice among government-operated schools may be a step in the right direction, caution is in order. The education monopoly will still be in charge, and parents will still be at its mercy.)

If business is to save education, then business must help education do what business knows how to do best: Operate by the rules of free enterprise.

Choice and competition are not panaceas. They alone will not solve all the problems, but they are the only continuing forces powerful enough to motivate those running the schools to continually seek better ways to educate the children they exist to serve and to meet the manpower needs of a rapidly changing, global economy.

We will still need the more traditional forms of business involvement, but without choice and competition, parents, citizens and business people will continue to spin their wheels and our children will be the losers.

Business and Education

Paul M. Ostergard, President,
General Electric Foundation,
Fairfield, Connecticut

In an effort to protect against projected declining enrollments in the early 1980s, colleges and universities began taking larger slices of youngsters from suburban public schools. They also stepped up recruiting of non-traditional students... older people, and those just out of the military. What they did *not* attempt was the tougher job of going into poor and inner city schools and attracting more minority youngsters into higher education.

At General Electric, we decided that if we were to see higher minority enrollments in universities, we had to get involved in public education directly. Initially, we had approached public schools at arm's length by funding return work through existing organizations. We funded a program to bring math and science teachers to college campuses in the summertime, for example, so they could learn new, exciting teaching methods. We also ran a program linking science museums to science classes in public schools. These efforts were productive, but we were still frustrated by our inability to get inside the schools and find out exactly what was going on. That's when we decided to become *directly* involved with schools.

Our first opportunity was the old Benjamin Franklin High School in East Harlem, New York City. Six years ago only 4 percent of the youngsters who entered there graduated. Drugs, dropouts—the school had them all.

The community had enough and asked the central school board to let them change the school into a "magnet" school, now known as the Manhattan Center for Science and Mathematics. The new school leaders asked us for volunteers to act as mentors, to help raise aspirations and self esteem and encourage youngsters to think of themselves as college material.

We then recruited volunteers with strong science and math backgrounds from our New York businesses. Each was assigned one-on-one with a student. Because East Harlem is a tough neighborhood, they had to get used to some things that were unfamiliar to them, and so did the kids.

At the request of the seven volunteers, the GE Foundation came up with an "enrichment" plan that includes such elements as SAT preparation. And Saturday academies in science and math taught by local professors. We have copies of "The New York Times" delivered to the students' homes each morning and take them on college field trips. The idea is to give them a much larger exposure to the world than they might otherwise have.

Now, 100 percent of the kids from that group go on to college. The 60 GE scholars in the school are getting into schools like Harvard, MIT and Cornell. Today the Manhattan Center for Science and Mathematics is the flagship of a network of about 40 schools with which we're involved. And, we hope to expand our efforts to 100 schools over the next few years.

The key to GE's work in public schools is our nationwide, volunteer employee organization called ELFUN Society, which is committed to community service. The Foundation challenged its members to get involved, particularly with public in education, focusing on poor and inner city schools. So far, each chapter has come up with a different proposal. That was exactly what we were looking for because there is no single model to fix a school.

The Louisville, Kentucky, ELFUN chapter, for example, started a parenting program to teach parents how to support and stimulate their youngsters' learning.

In other places, volunteers helped get computer labs going, suggested curriculum improvements and tutored elementary students in science.

In Lowndes County, Alabama, where GE has built a new plastics plant in a rural area, we've launched a $1 million project to upgrade an almost all black public school system. At the beginning we knew we would have to attract employees from other areas of the state, because there were so few in the immediate area qualified to work in a highly sophisticated workplace. We have set out to remedy this by instituting a long-term collaborative effort with the county education system. The goal is to triple the number of college-bound kids over the next five years. We've begun Saturday academies, SAT preparation sessions and other programs to put these kids on a comprehensive footing.

GE has announced a $20 million program called "College Bound" to double numbers of college ready youngsters in selected poor and inner city schools over the next decade. Large grants of $750 thousand to $1 million have already been committed to schools in Albuquerque, Cincinnati and Louisville and others will follow. In each case GE volunteers will play critical rules.

These experiences have convinced us that the one-on-one relationship is the missing piece in school reform. If you have only a grant mentality towards public schools, you will probably fail.

Business and Education

Joseph Nathan, Ph.D.,
Humphrey Institute of Public Affairs,
University of Minnesota, Minneapolis, Minnesota

The role of corporations in the improvement of education has gone through several phases. First, there was a belief that people in schools weren't getting enough recognition. So there were programs where corporations gave money to recognize outstanding teachers, principals and administrators, and also outstanding schools.

In the second phase, the business community was convinced that the problem was a lack of resources. So corporations gave "things" to schools, like machines, tutors or cash.

A third phase involved corporations setting educational priorities. For example, the Committee for Economic Development urged that corporations push for full funding of Head Start programs. Research makes it clear that high quality early childhood education makes an enormous difference in the lives of young people. We need to move immediately to fully fund Head Start in low-income communities. It should be a top priority of corporations.

Still another phase has called for school reorganization.

In some people's view, we had wonderful schools in the good old days. If we could just have them again, all our problems would be solved. But most of the kids who grew up in the 20s and 30s did not graduate from high school. It wasn't until 1953 that more than half of this country's youngsters did graduate. Those who graduated had strong skills. But the others didn't.

Today we need many more high quality workers, with the abilities, for example, to write an essay; to do sophisticated mathematics. We need people who understand the methods that politicians use—for better or worse. These are things that our schools today must do for all children, not just for those who are fortunate enough to go to exclusive public or private schools.

Parent involvement is another issue. We have this myth that some parents don't care about their kids. Virtually all parents want to help their children do better in school. Corporations might strongly encourage parents to become more involved with their schools. For example, parents could spend a half-day in their schools each month.

Corporations might have seminars at lunch time for parents who want to know how they can help their children do better in school. They might also sponsor similar meetings in inner city areas.

Entrepreneurship should be encouraged in public education. For example, in Minneapolis, business leaders have cooperated with the teachers' union to establish an entrepreneurial fund for teachers. The teachers are encouraged to come up with innovative new ideas, and the best are funded. Entrepreneurship is the bedrock of American business, yet we generally don't have such programs in education.

Computers should be made available to teachers to aid them in developing individualized education plans. With a computer, such plans can be done in a fraction of the time it takes by hand. This increases productivity. Corporations like Union Carbide are well qualified to help schools implement such computerization.

As for parental choice, the idea comes from both liberals and conservatives. In a recent Gallop study, more than 70 percent of Americans said that parents ought to have this right. Business groups in several

states, such as Minnesota, have worked with parent, community and education groups to help increase choice among schools.

With educational choice, the attitude of youngsters improves too. About an options program, one student said, "It changed me from thinking that high school and learning is worthless and boring to becoming excited about my education. Now I love to go to classes. I even enjoy the homework." There are many other similar examples of success.

When school choice is offered within or across a district line, choice expands opportunity. Many studies show well designed public school choice plans help increase student achievement, reduce dropout rate, stimulate greater parental involvement and raise morale of educators. However, movement should not be allowed across district lines if it negatively impacts desegregation and integration. Also, school districts should not be allowed to pick and choose among the kids.

No one group can do it all, but America's corporations can be a part of the solution to our public education problems.

Education Reform: Quick Fixes or Enduring Cures?

Albert Shanker, President,
American Federation of Teachers,
Washington, D.C.

Most of the discussion about education in this country centers around minority kids. This is good because these kids have been neglected. However, it creates the impression that if minorities were doing as well as whites, there would be no education problem, which is wrong.

The only good news in American education is that minorities have caught up very quickly in the last 20 years. Then, 17-year-old minority kids were eight years behind their white counterparts. Now they are only four years behind, which is a giant step forward, though there's still plenty to go.

The bad news is that even if every minority student immediately functioned at the same level as whites, we'd still have a national disaster in education. According to the National Assessment of Educational Progress, only 5 percent of 17-year-olds are able to write a good letter. To put that into worse perspective, that percentage doesn't take into account the kids who dropped out. In other words, we're only talking about the kids who will be graduating. In mathematics, only 12 percent can arrange six ordinary fractions in order of their size. Only 5 percent can successfully interpret a railroad timetable.

Obviously, we should be concerned about bringing up the bottom level of students. But we must also bring up the average and the top.

The assumption behind our education reform movement is that we have a system that's pretty close to where we want it to be, but we have a certain problem with quality control and we need to improve it a little bit. Well, we are *not* very close to where we want to be. Our results are absolutely dismal and shocking. We don't compare at all well with other countries.

Reform is not enough. We need a fundamental overhaul. The fundamental thing that's wrong with schools is that they are organized according to the notion that kids learn passively, just by being in the presence of teachers. And that learning takes place if a teacher does a good job at lecturing—sort of the empty vessel approach where a kid is waiting to be filled up with knowledge from the teacher.

We have known for over 2,000 years that this is not so. When Socrates was told by one of his disciples that he was a wonderful teacher, he said, "No, I am not a teacher, I am only a midwife. You, the student, are the one who has to get pregnant. You are the one who has to carry the child. You are the one who has to deliver it. I can only be of some help."

Learning is a result of listening, reading, talking, imagining, building and experiencing. It is a question of what the *student* does; the student has to be considered a worker, not raw material to be worked on by teachers.

You have to start thinking of a school in precisely the same way that a business manager thinks of a factory or an office. The issues are the same. How do you get the workers (the students) to come every day? How do you get them to do their work even when you're not watching them—because you can't watch them all the time.

If I worked in an office that was organized the way secondary schools are, I'd be given a desk, and there would be 25 or more other workers sitting around

me doing the same work. I could never talk to them. There would be a boss to tell me what to do. Every 50 minutes a bell would ring, and I'd go to another room with 25 different people to do a totally different kind of work—with a new boss. I'd be encouraged to make mistakes instead of checking my work with someone sitting next to me—because that would be cheating. And I'd be humiliated by having my mistakes called to the attention of the entire office.

It's not surprising that no office in the world is organized the way our schools are.

We need to say to central administrators, teachers and principals, "Abandon what you have and come up with a new plan." Take into account that kids should not compete with each other unfairly in a way that makes some feel they are stupid. Don't just talk most of the time: provide an alternative set of ways to learn.

That's important, because 85 percent of classroom time is presently taken up by the teacher talking. There are some students who don't learn very well that way. Everybody learns at a different rate. Yet we organize a classroom around a single rate, the rate the curriculum has to move at and at the rate the teacher talks.

We work against the team nature of kids, their innate desire to help one another. Why not get kids to help each other? Use their team nature to have them work in groups so they can cooperate with each other. Take advantage of technologies like video tapes, audio tapes and computers. Don't humiliate kids who don't know an answer by calling on them in front of all their peers. When you humiliate kids, they decide they don't want to play the game anymore.

If the kids are learning something for the first time, put them in a small, friendly group that can help them. Put them on their own team.

That's what a large West German school (2,200 enrollment) in Köln does. This school has kids who are not considered college material. It also has lots of poor immigrants, so it is not your typical middle-class German school. Students are formed into small teams of five or six each. What's even more interesting, the school assigns a small team of teachers to a specific group of students when they are in the fifth grade. The same teachers stay with these students for several years. That's continuity, accountability and community.

Furthermore, the teacher team has the autonomy to make all decisions concerning their students. They don't need to get the principal's permission to move them from one class to another.

There are no bells in the school. If the team decides they want to spend an entire morning on language instruction, they can. If they decide a session is too long, they can shorten it. The team makes their judgments on the basis of the students' needs. As a team, they even decide who will teach which subject, allowing each teacher to best utilize his or her strengths.

Contrast this with the situation in a typical American secondary school. When I taught in New York, I used to have 35 kids in each of five different classes per day. It took me eight weeks just to learn their names.

In the Köln school, guess what happens to a teacher who doesn't work out? You don't have to wait for the principal to come and get him. His colleagues will try to help him. But if they can't, they won't tolerate the situation for a long period of time.

What are the results? This German school sends a huge percentage of students on to college, including many who otherwise would have thought they were too dumb to go. Devise a school structure that's based on how kids learn and that allows teachers to be professionals—unlike what we now have—and you get a huge increase in student success.

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